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SHEPARD'S SUMMARY

Unrestricted *Shepard's* Summary

No subsequent appellate history.

Citing References:



Cautionary Analyses: **Distinguished (1)**

Positive Analyses: **Followed (1)**

Other Sources: **Law Reviews (6), Statutes (1), Treatises (16), Court Documents (4)**

LexisNexis Headnotes: HN1 (1), HN2 (5), HN3 (1), HN4 (2), HN5 (4)

PRIOR HISTORY (0 citing references)

(*CITATION YOU ENTERED*):

In re Johnson, 558 F.2d 1008, 1977 CCPA LEXIS 140, 194 U.S.P.Q. (BNA) 187 (C.C.P.A. 1977)

CITING DECISIONS (16 citing decisions)

3RD CIRCUIT - U.S. DISTRICT COURTS

1. **Distinguished by:**

Rohm & Haas Co. v. Mobil Oil Corp., 718 F. Supp. 274, 1989 U.S. Dist. LEXIS 8143 (D. Del. 1989) **LexisNexis Headnotes HN1, HN2, HN5**
718 F. Supp. 274 *p.*297

7TH CIRCUIT - U.S. DISTRICT COURTS

2. **Cited by:**

Unique Concepts, Inc. v. Manuel, 1986 U.S. Dist. LEXIS 22765, 231 U.S.P.Q. (BNA) 268 (N.D. Ill. July 15, 1986) **LexisNexis Headnotes HN2**
231 U.S.P.Q. (BNA) 268 *p.*273

9TH CIRCUIT - U.S. DISTRICT COURTS

3. Cited by:

Syntex LLC v. Apotex, Inc., 2003 U.S. Dist. LEXIS 26489 (N.D. Cal. Dec. 29, 2003)
2003 U.S. Dist. LEXIS 26489

4. Cited by:

W.L. Gore & Assoc., Inc. v. International Medical Prosthetics Research Assoc., Inc., 1990 U.S. Dist. LEXIS 15497, 16 U.S.P.Q.2d (BNA) 1241 (D. Ariz. May 10, 1990) **LexisNexis Headnotes HN5**
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5. Cited by:

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815 F.2d 686 *p.690*

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710 F.2d 1544 *p.1548*

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General Electric Co. v. United States, 1979 U.S. Cl. Ct. LEXIS 1008, 206 U.S.P.Q. (BNA) 260 (Cl. Ct. Trial Div. 1979) **LexisNexis Headnotes HN2, HN4, HN5**

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53 U.S.P.Q.2d (BNA) 1045 *p.1046*
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27 U.S.P.Q.2d (BNA) 1662 *p.1670*
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217 U.S.P.Q. (BNA) 804 *p.806*
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33. *2-VIII Patent Office Rules and Practice Rule 106*
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35. *4-XLVII Patent Office Rules and Practice Rule 41.207*
36. *7-2004 Patent Office Rules and Practice*
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BRIEFS (3 Citing Briefs)

40. *APOTEX, INC. v. SYNTEX LLC & ALLERGAN, INC.*, 2007 U.S. Briefs 35, 2007 U.S. S. Ct. Briefs LEXIS 2385 (U.S. July 9, 2007)

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42. *SYNTEX v. APOTEX*, 2001 U.S. Dist. Ct. Briefs 2214, 2003 U.S. Dist. Ct. Briefs LEXIS 336 (N.D. Cal. June 10, 2003)

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43. *FIRE KING INT'L v. TIDEL ENG'G, L.P.*, 2007 U.S. Dist. Ct. Motions 285289, 2008 U.S. Dist. Ct. Motions LEXIS 10627 (N.D. Tex. Apr. 30, 2008)

LEXSEE 1989 U.S. DIST. LEXIS 8143

**ROHM AND HAAS COMPANY, Plaintiff, v. MOBIL OIL CORPORATION,
RHONE-POULENC INC., RHONE-POULENC AGROCHIMIE, and
RHONE-POULENC AG COMPANY, Defendants. MOBIL OIL CORPORATION,
RHONE-POULENC INC., RHONE-POULENC AGROCHIMIE, and
RHONE-POULENC AG COMPANY, Plaintiffs, v. ROHM AND HAAS
COMPANY, Defendant**

Civil Action Nos. 78-384-JLL, 79-397-JLL (Consolidated)

UNITED STATES DISTRICT COURT FOR THE DISTRICT OF DELAWARE

718 F. Supp. 274; 1989 U.S. Dist. LEXIS 8143

June 30, 1989

CASE SUMMARY:

PROCEDURAL POSTURE: These consolidated actions involved the validity and infringement of six United States patents issued over 13 years. The actions were filed by plaintiff, the first company, who sought a declaratory judgment that one of the patents in the suit was invalid, unenforceable and not infringed and by defendant, the second company, for infringement of three other United States patents.

OVERVIEW: The patents involved in this suit were directed to herbicidal chemical compounds, compositions and methods. One patent was asserted against the second company and its assignees, and four were asserted against the first company. The court held that (1) the second company failed to meet its burdens of proof as to the allegations against the first company under 35 U.S.C.S. §§ 102 and 103; (2) the first company met its burden of proving by a preponderance of the evidence under 35 U.S.C.S. §§ 271 and 271(b); and (3) the second company did encourage and induce the infringing activities of its assignees. Thus, the second company was enjoined from further infringement on the first company's patent.

OUTCOME: The court enjoined the second company's further infringement.

CORE TERMS: compound, patent, acifluorfen, substituent, ring, herbicidal, isomer, prior art, subject matter, right hand, artisan, salt, invention, herbicide,

methyl ester, substitution, halogen, reissue, examiner's, infringement, composition, obviousness, sodium, embraced, plant, atom, invalid, tested, ether, weed

LexisNexis(R) Headnotes

Evidence > Procedural Considerations > Burdens of Proof > Clear & Convincing Proof
Patent Law > Inequitable Conduct > Effect, Materiality & Scierter > General Overview
Patent Law > Infringement Actions > Defenses > Patent Invalidity > Validity Presumption

[HN1] The parties bear a heavy burden to prove that the patent claims asserted against them are invalid or unenforceable. Each patent in suit is presumed valid, and each claim is presumed valid independently of the other claims. The challenger must prove facts to establish invalidity by clear and convincing evidence.

Patent Law > Statutory Bars > Public Use Bar > General Overview
[HN2] See 35 U.S.C.S. § 102(b).

Patent Law > Claims & Specifications > Definiteness > General Overview

Patent Law > Claims & Specifications > Description Requirement > General Overview

Patent Law > Claims & Specifications > Enablement

Requirement > General Overview

[HN3] See 35 U.S.C.S. § 112.

Patent Law > U.S. Patent & Trademark Office Proceedings > Continuation Applications > General Overview

[HN4] See 35 U.S.C.S. § 120.

Patent Law > Claims & Specifications > Claim Language > Multiplicity**Patent Law > U.S. Patent & Trademark Office Proceedings > Continuation Applications > Divisionals & Restrictions**

[HN5] See 35 U.S.C.S. § 121.

Patent Law > Jurisdiction & Review > Standards of Review > General Overview

[HN6] Appellate courts are not bound by Patent Office determinations where a challenger has carried its statutory burden proving invalidity in view of all of the evidence.

Patent Law > Nonobviousness > Elements & Tests > General Overview

[HN7] See 35 U.S.C.S. § 103.

Patent Law > Claims & Specifications > Enablement Requirement > General Overview**Patent Law > Inequitable Conduct > Effect, Materiality & Scierter > General Overview****Patent Law > Nonobviousness > Elements & Tests > General Overview**

[HN8] Whether a claimed invention is obvious under 35 U.S.C.S. § 103 requires determination of the scope and content of the prior art, the differences between the prior art and the claims at issue, the level of ordinary skill in the pertinent art, and any secondary considerations.

Patent Law > Inequitable Conduct > General Overview**Patent Law > Infringement Actions > Burdens of Proof****Patent Law > Infringement Actions > Defenses > Patent Invalidity > General Overview**

[HN9] The burden of going forward with evidence rebutting invalidity shifts to the patentee, but only after the party asserting invalidity has established a legally sufficient prima facie case of invalidity. The court then

looks at all of the evidence of invalidity together with all of the evidence rebutting invalidity, if any, and decides whether there is clear and convincing evidence that the patent is invalid.

Patent Law > Nonobviousness > Elements & Tests > General Overview

[HN10] Obviousness is a legal conclusion barring the patentability of a claim applied for, or serving as a basis for the invalidity of an issued claim. It is a matter of patent law not chemistry. The requirement of unobviousness in the case of chemical inventions is the same as for other types of inventions.

Administrative Law > Judicial Review > Reviewability > Factual Determinations

[HN11] The fact finder is entitled to his own ideas as to what evidentiary facts will persuade him of unexpected results and that whether rebuttal evidence is sufficient to persuade the examiner that unexpected results exist is an evidentiary matter for the trier of fact.

Patent Law > Inequitable Conduct > Effect, Materiality & Scierter > General Overview

[HN12] See 37 C.F.R. § 1.56.

Patent Law > Inequitable Conduct > Effect, Materiality & Scierter > General Overview

[HN13] Materiality and intent to deceive must be determined separately. If the court finds that there is clear and convincing evidence of at least a threshold degree of each, then their relative degrees must be balanced to determine whether as a matter of law there has been inequitable conduct.

Patent Law > Inequitable Conduct > Burdens of Proof

[HN14] Inequitable conduct is not established by a mere showing that information having some degree of materiality was not disclosed. There must have been an intent to act inequitably. The conduct in question, viewed in light of all the evidence, including evidence indicative of good faith, must indicate sufficient culpability to require a finding of intent to deceive.

Patent Law > Infringement Actions > Burdens of Proof**Patent Law > Infringement Actions > Infringing Acts >**

Make**Patent Law > Infringement Actions > Infringing Acts > Sale**

[HN15] Infringement is the unlicensed making, using, or selling of a claimed invention. A patentee bears the burden of proving infringement by a preponderance of the evidence.

Patent Law > Infringement Actions > Defenses > Patent Invalidity > General Overview

[HN16] There can be no infringement of an invalid patent.

**Patent Law > Infringement Actions > Infringing Acts > Contributory, Indirect & Induced Infringement
Patent Law > Remedies > Bad Faith Enforcement**

[HN17] See 35 U.S.C.S. § 271(b).

Patent Law > Infringement Actions > Infringing Acts > General Overview

[HN18] A party infringes by actively and knowingly aiding and abetting another's direct infringement.

Patent Law > Infringement Actions > Infringing Acts > General Overview

[HN19] Infringement is a tort.

Governments > Legislation > Statutory Remedies & Rights**Patent Law > Remedies > Equitable Relief > Injunctions**

[HN20] The principal value of a patent is its statutory right to exclude others from the unlicensed practice of the invention.

Patent Law > Remedies > Equitable Relief > Injunctions

[HN21] Once the patent has survived the allegations of invalidity and has been proved infringed, the patentee should be entitled to the full protection of its right. Thus, irreparable harm from future unlicensed practice may be presumed.

COUNSEL: [**1] Rudolf E. Hutz, Januar D. Bove, Jr. and Mary W. Bourke of Connolly, Bove, Lodge & Hutz, Wilmington, Delaware, William E. Lambert III and

Terence P. Strobaugh of Philadelphia, Pennsylvania, of counsel, for Rohm and Haas Company.

Charles S. Crompton, Jr. of Potter, Anderson & Corroon, Wilmington, Delaware, John A. Diaz, J. Robert Dailey, Arnold I. Rady, Jean M. Duvall, and Shaham Islam of Morgan & Finnegan, New York, New York, of counsel, for Mobil Oil Corporation, Rhone-Poulenc, Inc., Rhone-Poulenc Agrochimie, and Rhone-Poulenc AG Company.

JUDGES: James L. Latchum, Senior United States District Judge.

OPINION BY: LATCHUM**OPINION**

[*277] I. INTRODUCTION JAMES L. LATCHUM, SENIOR UNITED STATES DISTRICT JUDGE

These consolidated actions ¹ involve the validity and infringement of six U.S. patents issued over the past 13 years. The actions were filed by the Rohm and Haas Company ² on September 11, 1978 (C.A. No. 78-384-JLL) seeking a declaratory judgment that one of the patents in suit, U.S. Patent 3,979,437, was invalid, unenforceable and not infringed (Docket Item ["D.I."] 1), ³ and by the Mobil Oil Corporation ⁴ on August 14, 1979 (C.A. No. 79-397-JLL) for infringement of three other U.S. Patents. The answers and counterclaims in these suits and subsequent amendments to the pleadings raised [**2] the validity, enforceability, and infringement of the six patents now in suit.

1 The Court's jurisdiction over patent infringement actions is found in 28 U.S.C. § 1338. The two captioned actions were consolidated by Order of this Court on November 12, 1981. (D.I. 92.)

2 Rohm and Haas Company is a corporation organized and existing under the laws of the State of Delaware with its principal place of business in Philadelphia, Pennsylvania. (D.I. 283, Tab 3A, para. 1.4.)

3 Most items were filed by the parties with the Court in duplicate, one under the caption of each case. Throughout this opinion the "Docket Item" references will be to the number assigned to an item under the caption of C.A. No. 78-384-JLL.

unless otherwise noted.

4 Mobil Oil Corporation is organized and existing under the laws of the State of New York with its principal place of business in New York City, New York. (D.I. 283, Tab 3A, para. 1.1.)

The six patents in suit are directed to herbicidal chemical compounds, compositions and methods. Two patents are asserted against Mobil Oil Corporation and its assignees, and four are asserted against Rohm and Haas Company. (D.I. 283, Tab 3A, para. 4.)

The [**3] issues of liability and damages in the actions were bifurcated for separate trials by stipulated Order of the Court on October 17, 1986. (D.I. 161.) The parties have also stipulated that to the extent the patents asserted against them are valid and enforceable, certain of their activities have infringed. (See D.I. 283, Tab 3A, para. 9.0 *et seq.*, para. 17.0 *et seq.*)

The liability issues were tried by the Court without a jury from October 3, 1988 through November 3, 1988. Post-trial briefing was directed by the Court and completed by the parties on March 30, 1989.⁵ After carefully considering the sufficiency, weight, and credibility of the testimony of the witnesses, their demeanor on the stand, the documentary evidence admitted at trial, and the able submissions of the parties, the Court enters the following findings of fact and conclusions of law which are embodied in this opinion as permitted by *Rule 52(a), Fed.R.Civ.P.*

5 The Court directed separate briefing on the invalidity and unenforceability of the Rohm and

Haas patents and the Mobil et al. patents. (See Tr. at 3618-19; see also D.I. 315, modified by Order D.I. 321.) The briefs were filed as follows:

(a) Rohm and Haas Company's Post-Trial Brief Challenging the Validity and Enforceability of the Mobil Patents (D.I. 317; Answering Brief After Trial of Mobil Oil Corporation, et al. Re Validity and Enforceability of the Mobil Patents (D.I. 319); and Rohm and Haas Company's Reply Brief Challenging the Validity and Enforceability of the Mobil Patents (D.I. 323).

(b) Main Brief After Trial of Mobil Oil Corporation et al. Re Invalidity and Unenforceability of the Rohm and Haas Patents (D.I. 316); Rohm and Haas Company's Post-Trial Brief Defending the Validity and enforceability of Its Patents (D.I. 318); and Reply Brief of Mobil Oil Corporation et al. Re Invalidity and Unenforceability of the Rohm and Haas Patents (D.I. 322).

[**4] II. HISTORY AND BACKGROUND OF THE LITIGATION

The trial in these cases followed over a decade of pursuit by the parties. In that period, the complexion of the cases has changed. Patents have issued and have been added to the litigation,⁶ several have been withdrawn from the litigation, and several have gone through reissue proceedings in the United States Patent and Trademark

[*278] Office (the "Patent Office").⁷

6 The particular patents in suit are discussed more fully in Section III *et seq.* of this Opinion.

7 On October 19, 1978, Mobil applied for reissue of U.S. Patent 3,979,437 under 37 C.F.R. § 1.171 *et seq.* (1977). The then recently modified reissue procedures enabled a patentee to seek reconsideration of an issued patent in view of relevant information or prior art not previously considered by the Patent Office. Mobil sought a stay from the Court pending that procedure, and on December 12, 1978, the Court granted the stay but allowed limited discovery to continue. (D.I. 20.) See also *Rohm and Haas Co. v. Mobil Oil Corp.*, 462 F. Supp. 732 (D.Del. 1978). The Patent Office subsequently rendered a decision substantially upholding the validity of the Mobil patent. Mobil then moved for an order preliminarily enjoining Rohm and Haas from further infringement of it. (D.I. 38.) On November 12, 1981, the Court concluded that the preliminary injunction was not warranted, and allowed consolidation of the two civil actions. (D.I. 92.) See also *Rohm and Haas Co. v. Mobil Oil Corp.*, 525 F. Supp. 1298 (D.Del. 1981)

[**5] Moreover, the winds of corporate change have landed ownership of, or the rights under, most of the patents in suit in different hands than when these actions were filed. On July 31, 1981, the Mobil Oil Corporation sold its agricultural chemicals business to Rhone-Poulenc, Inc. ("RPI"),⁸ including one patent asserted here and two patents since reissued as patents asserted here. (D.I. 283, Tab 3A, para. 1.A2.) RPI was then added by stipulation as a party to both actions. (D.I. 85; RX 2601, Tab A, para. 3.6.) On February 11, 1982, RPI assigned the patents to Rhone-Poulenc Agrochimie ("RPA") (*id.*),⁹ and RPA was added as a party by stipulation. (D.I. 97; D.I. 283, Tab 3A, para. 1.A2.) On April 6, 1982, Rhone-Poulenc Agrochimie¹⁰ was joined as a party to both actions. (RX 2601, Tab A, para. 3.8; D.I. 58, 97.) RPAG is a wholly owned subsidiary of RPI.

Mobil Oil Corporation and the parties added will be referred to throughout this opinion collectively as "Mobil" unless otherwise noted.

8 RPI is a corporation organized and existing under the laws of the State of New York with its principal place of business in Black Horse Lane, New Jersey. (D.I. 283, Tab 3A, para. 1.3.)

9 RPA is a corporation organized and existing under the laws of the Republic of France, with its principal place of business in Lyon, France. (D.I. 283, Tab 3A, para. 1.2.) One of the patents in suit, U.S. Patent 4,681,622, has been owned by RPA since issued on July 21, 1977. (*Id.* at paras. 1.A2, 4.5.)

[**6]

10 RPAG is a corporation organized and existing under the laws of the Commonwealth of Pennsylvania, with its principal place of business at Research Triangle Park, North Carolina.

On May 6, 1987, the Rohm and Haas Company entered into a purchase agreement with BASF Corporation ("BASF"),¹¹ pursuant to which BASF was, *inter alia*, given a fully paid exclusive option to acquire an exclusive license to the two Rohm and Haas patents in suit. (*Id.* at para. 1.B1.) Rohm and Haas has retained ownership of the patents, and has continued to make and sell to BASF technical grade compounds covered by several patents in suit. (*Id.* at para. 5.3.) Rohm and Haas also has agreed to defend and hold BASF harmless for infringement of the Mobil patents in suit. (D.I. 317 at *viii.*)

11 BASF is not a party to either of the actions presently before the Court.

All of the patents in suit are directed, generally, to substituted diphenyl ether compounds useful as herbicides. (RX 2601, Tab A, para. 8.1.)¹² That is, the compounds have a diphenyl ether backbone which consists of two benzene rings¹³ connected

[*279] through an ether linkage. ¹⁴ The structural formula of the backbone is as [**7] follows:

[SEE ILLUSTRATION IN ORIGINAL]

(See D.I. 285 at 22-23; *see also* Tr. at 84-88, 423.) Each of the six corners of each benzene ring represents a carbon atom (*see* Tr. at 51, 92; *see also* D.I. 285 at 11), and each carbon atom not bonded to the ether oxygen atom can be substituted. (Tr. at 52, 92.) Therefore, there are five sites for substitution on each benzene ring of a diphenyl ether. (Tr. at 92.)

12 As discussed more fully in Section III *et seq.*, *infra*, the claims in suit are directed to either compounds or to herbicidal compositions or methods including the compounds.

13 Benzene is an aromatic hydrocarbon of the structure:

[SEE ILLUSTRATION IN ORIGINAL]

Each corner of the hexagon represents a carbon atom, and the sides and circle represent the bonding between carbon atoms. The bonding is sometimes also represented as:

[SEE ILLUSTRATION IN ORIGINAL]

But the bonds are not simply alternating single and double bonds. Rather, the electrons are diffused and shared by all six carbon atoms. This gives benzene, in particular, and aromatic compounds, in general, unique chemical properties not possessed by aliphatic hydrocarbons. (D.I. 285 at 11.)

14 An ether is a compound of the general formula R-O-R, where the R's are substituted or unsubstituted, hydrocarbyl radicals. In a diphenyl ether the R's are benzene rings. (*See* D.I. 285 at 22.)

[**8] There are several conventions known to the art for the naming of substituted diphenyl ether compounds. For this Opinion, the Court will use the convention agreed to by the parties for trial. (RX 2601, Tab C at 23.) Referring to the structural formula above, the benzene rings will be the "left hand ring" and the "right hand ring" respectively, and the carbon atoms will be numbered counterclockwise and clockwise respectively as follows:

[SEE ILLUSTRATION IN ORIGINAL]

(D.I. 283, Tab C at 22-23.)

Substituted diphenyl ether herbicides were known to the art long before any of the patent claims in suit were filed in the Patent Office. (Tr. at 423; *see also* JX 1166 at 600046-52; MX 1459(A); RX 2036; Tr. at 2032, 3287-88.) As will become evident in the sections of this Opinion to follow, it is the substitution of the rings according to the various limitations of the claims in suit which is critical to the resolution of this litigation.

The impetus for this litigation apparently is the commercial success of a herbicidally active ¹⁵ substituted diphenyl ether compound known as acifluorfen sodium, or the sodium salt of acifluorfen. ¹⁶ The compound has the following structure:

[SEE ILLUSTRATION [**9] IN ORIGINAL]

15 The definition of "herbicidal activity" is relevant to certain challenges to the validity of the patents in suit. Generally, "herbicidal activity" is the ability of a substance to kill plants. (*See* Tr. at 207.) But, under this definition almost anything in the world can be a "herbicide" or show "herbicidal activity" if enough of it is applied to a plant. (*See id.* at 208.) As put by Dr. Donald Penner, a weed scientist, professor and researcher at the University of Michigan with nearly 30 years' experience in the art (*see* RX 2503), "you can kill plants with a lot of milk." (*Id.*) Thus, with respect to the utility of the inventions in suit herbicidal activity must be viewed with regard to an application or dosages rate. (*See id.* at 208-210.) Dr. Penner testified that "years ago, the chemical companies were looking for compounds that would kill plants at ten pounds or less . . . [applied uniformly over an acre, but that] now they are looking for compounds that will kill at less than a pound, for sure." (*Id.* at 208.) The Mobil patents in suit state that the claimed compounds are effective herbicides when applied at rates between about 0.2 pounds and about 10 pounds per acre. (*See, e.g.*, RX 2508, Tab 4, cols. 5-6.) The Rohm and Haas patents in suit provide that the claimed compounds can be applied in any amount that will give the required control of weeds, preferably from about 0.1 to 12 and "most preferably" 0.125 to 4 pounds per acre. (*See, e.g.*, RX 2509, Tab 4,

col. 5, *ll.* 7-10.)

[**10] 16 By various systems of nomenclature acifluorfen sodium is known as: the sodium salt of 5-(2-chloro-4-trifluoromethyl-phenoxy)-2-nitrobenzoic acid; the sodium salt of 2-nitro-5-(2-chloro, 4'-trifluoromethylphenoxy) benzoic acid; and, the sodium salt of 2-chloro, 4-trifluoromethyl, 3'-carboxy, 4'nitro diphenyl ether. (D.I. 283, Tab 3A, para. 5.1.)

Acifluorfen sodium is the active ingredient ¹⁷ in commercial products of both Rohm

[*280] and Haas and Mobil, marketed under the registered trademarks of "BLAZER" AND "TACKLE," respectively. (D.I. 285 at 34; D.I. 283, Tab 3B, para. 15.0 *et seq.*) BLAZER and TACKLE are selective post-emergence contact herbicides,¹⁸ which control a broad spectrum of broadleaf weeds¹⁹ commonly found in soybeans. (*Id.*)

17 When applied in a commercial product acifluorfen sodium is included in a formulation, which is a combination the active ingredients with other ingredients such as solvents, surface active agents and other adjuvants. (D.I. 283, Tab 3B, Appendix A at 3.)

18 A selective herbicide is a chemical that is more toxic to some plant species than to others (e.g. more toxic to weeds than crops). (D.I. 283, Tab 30, Appendix A at 6.) A post-emergence herbicide is applied to a plant after it has emerged from the soil. (*Id.* at 5.) a contact herbicide causes localized injury to plant tissue where it contacts the plant (e.g., roots, stems and foliage) without substantial translocation within the plant. (*Id.* at 2.) While the mode of action of BLAZER and TACKLE is not known (*Id.* at Tab 3B, para. 15.9), they disrupt plant cell membranes shortly after contact, and once they penetrate practically all movement within the plant stops. (*Id.* at para. 15.3.)

[**11]

19 A "weed" is a plant growing where it is not desired. (D.I. 283, Tab 3B, Appendix A at 7.) Thus, a "weed" could be a dandelion in a cornfield or corn in a dandelion field. (*See* Tr. at 198, 320, 2884-85.) In the words of one expert at trial, Dr. Ilnicki, purporting to quote Ralph Waldo Emerson, a "weed" is "a plant whose virtues have not yet been discovered." (Tr. at 2885.)

The evidence established that, at least as between Rohm and Haas and Mobil, it was Rohm and Haas, through its researchers, most notably Dr. Colin Swithenbank, that discovered the high herbicidal activity of acifluorfen,²⁰ its methyl ester, and ultimately its sodium salt. In January 1972 Dr. Swithenbank met with Rohm and Haas' patent attorney to discuss the subject matter of several proposed patent applications based on his research. (*See* Tr. at 3173-74.) He memorialized this meeting in a memorandum to his supervisor, Dr. Horst Bayer,²¹ in which he described the subject matter of

three proposed "Patents." (JX 1047.) One embraced 3'-carboxy, 4'-NO[2] compounds. (*See id.* at 2 ("Patent II"); Tr. at 3175.) A patent application, Serial No. 234,651, was in fact filed by Rohm and Haas directed to [*12] this subject matter on March 14, 1972. (*See* RX 2509, Tab 1; Tr. at 3175.) The application eventually issued as U.S. Patent 3,793,276 ("276"). (RX 2509, Tab 1.) However, while compounds had been synthesized and tested at Rohm and Haas having the 4'-NO[2], 2-Cl and 4-CH[3] substituents (as in the acifluorfen compounds) (*see* Tr. at 3318), no compound had yet been synthesized or tested which also had a carboxy at the 3'-position (as in the acifluorfen compounds). (*See* Tr. at 3193.)

20 Acifluorfen is the acid form of acifluorfen sodium, that is the sodium (Na) substituent is hydrogen (H). (D.I. 285 at 35; Tr. at 1418.)

21 Dr. Bayer was Dr. Swithenbank's supervisor at Rohm and Haas at that time, and is also a coinventor with Dr. Swithenbank on the Rohm and Haas patents in suit.

At the direction of Dr. Swithenbank acifluorfen was first synthesized at Rohm and Haas on or about October 13, 1972 (*see* MX 1068 at 501509; *see also* Tr. at 3357-58), converted to its methyl ester on or about October 17, 1972 (*see* MX 1069 at 501591; *see also* Tr. at 3361), and to its sodium salt on or about January 3, 1973 (*see* MX 10700 at 501636; *see also* Tr. at 3362). [*13] The results of initial greenhouse testing²² of acifluorfen esters showed very good herbicidal activity. (MX 1198; MX 1199; MX 1206; MX 1281.)

22 Greenhouse testing is the evaluation of herbicidal activity on plants growing in a greenhouse generally with a controlled environment. (D.I. 283, Tab 3B at 3.) This is typically an early stage of testing.

On February 12, 1973, Rohm and Haas filed several continuation-in-part applications based on compounds synthesized by Dr. Swithenbank since the 1972 application was filed. (JX 1079; *see* JX 1063.) One of these claimed 3'-carboxy, 4'-NO[2] compounds for the first time, and specifically named and provided herbicidal data for acifluorfen and its methyl ester. (JX 1079.) This eventually issued as U.S. Patent 3,928,416 ("416"). (RX 2509, Tab 2.)

[*281] On March 14, 1973, Rohm and Haas filed a foreign counterpart to this application in the Netherlands (the "Rohm and Haas Netherlands application"). (RX 2099; RX 2099.1 [English translation].) It also specifically disclosed and provided herbicidal data for acifluorfen and its methyl ester. (See RX 2099.1.) The Rohm and Haas Netherlands application was published in accordance with foreign [*14] practice on September 18, 1973. (See *id.* at 1.)

Field testing ²³ of acifluorfen and its esters in 1973 and 1974 led Rohm and Haas to conclude that while the compounds showed very good herbicidal activity against problem weeds, they were also phytotoxic ²⁴ to crops such as soybeans. (See MX 1215; MX 1225; MX 1226.)

23 Field testing is testing and evaluation of the effect of herbicides on plants grown in the field. (D.I. 283, Tab 3B at 3.) It generally follows greenhouse testing.

24 Phytotoxicity is injury to plants. (D.I. 283, Tab 3B at 4.)

In October 1974 the suggestion was made at Rohm and Haas to test certain salts of acifluorfen, including the sodium salt, in view of the then recent development of an improved process for synthesis. (MX 1290; see also MX 1221.) Initial testing showed the sodium salt to be herbicidally effective and less phytotoxic than the other acifluorfen compounds tested. (See MX 1135.) Subsequent field testing of the sodium salt in 1975 confirmed this, showing excellent weed control applied both pre-emergence and post-emergence at low rates with little injury to the crop. (MX 1137; MX 1242.)

Mobil's arrival at the acifluorfen compounds [*15] was hardly as profound. On April 29, 1969, Mobil filed a patent application based on the research of Dr. Robert Theissen. The application, Serial No. 819,412, was directed to substituted diphenyl ether compounds having a 3'-carboxy, 4'-NO₂ left hand ring, and a halogen-only right hand ring. (See RX 2508, Tab 1.) There could be one or up to five halogen substituents on the right hand ring. (*Id.*) This application, which issued March 28, 1972 as U.S. Patent 3,652,645 (" '645"), disclosed and

provided data for a 2,4 dichloro substituted compound, later commercialized by Mobil in MODOWN. (See *id.*)

On February 11, 1971, Mobil filed a continuation-in-part of its 1969 application. (JX 2522.) This application, Serial No. 114,712 (the "1971 application"), was directed to a broader class of substituted diphenyl ether compounds which embraced the acifluorfen compounds. But the broad claims embracing the acifluorfen compounds were not allowed by the Patent Office. (See *id.* at 30-31.) The claims were amended and eventually allowed as U.S. Patent 3,784,635 (" '635"), but as amended they did not embrace the acifluorfen compounds. (See RX 2508, Tab 2 at col. 7-8.) Between April [*16] of 1969 and February 1971, 87 compounds were synthesized and tested at Mobil which fell within the broadened disclosure in the 1971 application. (JX 1609 at 2-7; Tr. at 1358-59, 1617-19.) Of these, 51 had all halogen right hand ring substitutions. (JX 1609 at 2-7; Tr. at 1619-20.)

After filing the 1971 application, a less than aggressive program was underway at Mobil with respect to synthesis and testing of compounds embraced by the 1971 application. From the filing date of the 1971 application through 1973, only 54 compounds embraced by the 1971 application were synthesized and tested. (JX 1609 at 8-13.) ²⁵ None had the particular right hand ring substitution of the acifluorfen compounds, that is 2-chloro, 4-trifluoromethyl (CF₃). (Tr. at 376-77; see also JX 1609 at 8-13.)

25 Dr. George Levitt, an expert chemist with over 30 years' experience in the industry (see note 69, *infra*) testified that in his experience in the early 1960's to mid 70's, an average synthesis chemist in this area was expected to produce about 200 new compounds a year for screening. (Tr. at 1930.)

No compounds within the 1971 application were synthesized and tested at Mobil in 1974. (See [*17] JX 1609 at 13.) Mobil's diphenyl ether research program was limited

[*282] to "defensive research" and "minimum surveillance." (RX 2093; RX 2095; RX 2096.) Mobil had decided to go with MODOWN as its best commercial product. (See RX 2094 at 78482; Tr. at 469-70, 621-22, 646.) Its research efforts had failed to produce any other promising herbicides. (Tr. at 469-70.)

It was not until after Mobil obtained a copy of the published Rohm and Haas Netherlands application disclosing and providing data for acifluorfen and its methyl ester in March of 1975 that Dr. Theissen began to synthesize and test these compounds. (Tr. at 384.) It is clear that Dr. Theissen obtained a complete "personal" copy of Rohm and Haas' Netherlands application by March of 1975. (RX 2099; Tr. at 1128-29.)²⁶ He placed handwritten "checkmarks" on his copy next to the names of acifluorfen and its methyl ester (RX 2099 at; Tr. at 1131-32), and, in fact, drew out their structures in a margin next to their herbicidal data (RX 2099; Tr. at 1132). His own testimony was that the Rohm and Haas Netherlands application "was one of the considerations that . . . [he] used" in deciding to synthesize acifluorfen and its methyl [*18] ester. (Tr. at 1468-69.)²⁷

26 Dr. Theissen's "personal" copy of the Rohm and Haas Netherlands application bears a Mobil Chemical Company "Library" stamp date of March 18, 1975. (RX 2099 at 1.) It should be noted, however, that Theissen was aware of the published application in 1973 when he saw an abstract of a publication of it, long before the date of the "Library" stamp. (Tr. at 1458-59; RX 2042 at 26102, *see also* Tr. at 535-36.) The abstract appeared in an industry "alerting bulletin" published regularly to alert the industry of, *inter alia*, published patent applications. Dr. Harold Kaufman, Theissen's supervisor at Mobil at that time, testified that he would have received such abstracts "shortly after" publication of the abstracted source, and that chemists reporting to him such as Theissen would similarly have seen the abstracts at that time. (Tr. at 375-76.) While the abstract of the published Netherlands application did not specifically name the acifluorfen compounds, Theissen was interested enough in it to write "Same as our previous U.S. application" on his copy. (See RX 2042 at 26102.)

27 Dr. Kaufman also testified that the Rohm and

Haas Netherlands application "influenced" Theissen to synthesize acifluorfen (Tr. at 378-79).

[**19] In April of 1975 Dr. Theissen wrote out a proposed synthetic route in his laboratory notebook for preparing acifluorfen compounds, that is compounds having a 2-Cl, 4-CF₃, 4'NO₂ and 3'-carboxy substitution. (RX 2047 at 177204; Tr. at 1135.) Dr. Theissen then tried unsuccessfully to produce an intermediate needed for his synthetic route. (RX 2047 at 177204; Tr. at 1135-38.)

On June 5, 1975, Dr. Theissen succeeded in making the isopropyl ester of acifluorfen (which was not disclosed in the Rohm and Haas Netherlands application) in a sufficient quantity for herbicidal testing, but did not send the compound for testing because he was interested in obtaining the methyl ester. (RX 2047 at 177205; Tr. at 1140-49.) Dr. Theissen was unsuccessful in his attempts to convert the isopropyl ester to the methyl ester. (RX 2047 at 177205; Tr. at 1147-50.) Therefore, he set out on a different tack for synthesis, employing the starting materials disclosed in the Rohm and Haas Netherlands application. (RX 2047 at 177205-06; Tr. at 1153-57.)

Dr. Theissen finally succeeded in synthesizing acifluorfen and converting it to its methyl ester on September 13 and 14, 1975. (Tr. at 1157; RX 2047 at 33927; [**20] RX 2049; RX 2051.) He immediately sent the compounds for herbicidal testing. (RX 2050; RX 2052.) Although the compounds had never before been tested by anyone at Mobil (Tr. at 1159-62; *see also* Tr. at 377), Dr. Theissen's written comments to testing personnel referred to their disclosure in the Rohm and Haas Netherlands application and noted that they were "potent herbicide[s]." (RX 2050; RX 2052).²⁸ In fact, no compound within the 1971 application had been synthesized and tested since 1973. (JX 1609 at 13.)

28 (RX 2050 ["use sparingly -- *potent herbicide*"] (emphasis in original)); RX 2052 ("very potent herbicide").

The results of these tests immediately "sparked" renewed interest at Mobil in substituted diphenyl ether herbicides, and more particularly the acifluorfen compounds. (RX 2060 at 958; Tr. at 494-95.)

[*283] From September 1975 through July 1977, 12 compounds were synthesized and tested within the 1971 application and 10 had the 2-Cl, 4-CF₃ right hand ring substitution of the acifluorfen compounds. (MX 1609 at 13-14.)

In March of 1977 Mobil conducted a "comprehensive in-house review of future prospects for herbicides." (Rx 2121 at 30283; Tr. at 1166; *see* RX [*21] 2122.) Rohm and Haas' BLAZER (coded as RH 6201) was discussed, although at that time its structure was not known. (RX 2122 at 75697; Tr. at 1171.) It was observed, *inter alia*, that BLAZER gave "good broadleaf/grass control" with "very little soybean injury." (RX 2122 at 75697; Tr. at 1172.)

In June of 1977, Dr. Theissen obtained a sample of BLAZER. (Tr. at 1184.) He requested analyses of it on June 12. (RX 2100; *see also* Tr. at 1185.) Upon receiving the results of the analyses, he became aware for the first time that BLAZER contained the sodium salt of acifluorfen. (Tr. at 1186.) The same day he received the results, Dr. Theissen instructed his technician to synthesize the sodium salt of acifluorfen. (RX 2072A; Tr. at 1186-87.) The synthesis was completed on June 22, 1977 (Tr. at 1187-88), and the compound was immediately sent out for greenhouse testing (*id.*; RX 2072).

The Court is convinced that Mobil's diphenyl ether herbicide program was essentially moribund as of 1974 with respect to synthesis and testing of compounds within the broad class of compounds disclosed in the 1971 application. Mobil had not come up with any compound showing commercial promise, other than [*22] the MODOWN compound with its 2,4-dichloro right hand ring. (JX 2092 at 31784; RX 2276 at 78845, 78847; MX 1346; JX 2140; Tr. at 621-22, 646-48.) It was the revelation by the Rohm and Haas Netherlands application which put Mobil and Dr. Theissen onto the acifluorfen compounds. Perhaps it was best put by Dr. Theissen in a research report for May and June of 1977 where he stated that Mobil's research program had been "reinstitutioned in light of the extraordinary activity exhibited by trifluoromethyl substituted diphenyl ethers." (RX 2123 at

445.)

Beginning in September of 1975, Mobil filed various patent applications with claims embracing the acifluorfen compounds. These were filed as continuation applications, relying on the 1971 application for priority. These applications resulted in the eventual issuance of the Mobil claims in suit. The filing date of the 1971 application trumps that of the Rohm and Haas claims in suit, as well as publication of the Rohm and Haas Netherlands application.

Now both Rohm and Haas and Mobil have come before the Court with claims covering the BLAZER and TACKLE products, each asserting the invalidity of the other's. Rohm and Haas has made and sold BLAZER [*23] in the United States since 1979. (D.I. 283, Tab 3A, para. 5.3.) Final commercial registration for use of BLAZER on soybeans was not granted to Rohm and Haas by the Environmental Protection Agency ("EPA") until April 1980 (*id.* at Tab 3B, para. 15.7), but in 1979 six states sought and obtained emergency exemptions for early use of BLAZER (*id.* at para. 16.6).²⁹ From 1979 through 1987, roughly \$ 28.1 million was spent on the advertising and promotion of BLAZER. (*id.* at para. 15.10.) Over this same period roughly 67.3 million pounds of BLAZER were sold in the U.S. for total sales of \$ 365.3 million, and 73.7 million pounds worldwide³⁰ for total sales of \$ 417.5 million. (*id.* at para. 15.13.)

29 An exemption is granted by the EPA where no other available product adequately controls a particular weed. (D.I. 283, Tab 3B, para. 15.5.) The time for commercialization and marketing of new herbicides in the U.S. is dependent on receiving registration from the EPA. (*id.* at para. 16.19.)

30 "Worldwide" includes figures for the U.S. (D.I. 283, Tab 3B, para. 15.13 n. *.)

By September of 1980, Mobil also was commercially manufacturing acifluorfen, converting it to acifluorfen [*24] sodium and exporting it under the trade name TACKLE. (*id.* at paras. 16.4-16.6.) Mobil did not have an

[*284] EPA registration for acifluorfen or its salts and esters, and could not market those products for use as herbicides in the U.S. (*Id.* at para. 16.4.) In late April of 1981, Mobil decided to seek EPA registration for TACKLE (*Id.* at para. 16.17), and was granted final commercial registration for use on soybeans in April 1986. (*Id.* at para. 15.8.) From 1986 through 1987 roughly \$ 6.1 million was spent on the advertising and promotion of TACKLE. (*Id.* at para. 15.11.) Over the same period roughly 0.5 million pounds of TACKLE were sold in the U.S. for total sales of \$ 14.5 million, and one million pounds worldwide for total sales of \$ 25.2 million. (*Id.* at para. 15.14.) The Court now turns to the patents in suit.

III. THE SIX PATENTS In SUIT

There are four patents asserted here by Mobil, U.S. Patent 3,979,437 (" '437") issued September 7, 1976, U.S. Reissue Patent 32,215 ("Re '215") issued July 22, 1986, U.S. Reissue Patent 32,216 ("Re '216") issued July 29, 1986, and U.S. Patent 4,681,622 (" '622") issued July 21, 1987. (D.I. 283, Tab 3A, paras. 4.2-4.5.)

The '437 [**25] patent issued from application Serial No. 617,569, filed September 29, 1975, as a continuation of Serial No. 398,610 filed September 19, 1973, as a continuation of the 1971 application, *supra*. (*Id.* at para. 4.2.) Serial No. 398,610 issued March 2, 1976, as U.S. Patent 3,941,830 (" '830"), and as discussed *supra* the 1971 application issued January 8, 1974, as the '635 patent. (*Id.* See also RX 2508.) Only Claim 1 of the '437 patent is asserted here.

Re '215 issued from Serial No. 469,563 filed February 23, 1983, as a continuation of Serial No. 279,274 filed June 5, 1981 to reissue U.S. Patent 4,164,409 (" '409"). (D.I. 283, Tab 3Z, para. 4.3.) (*Id.*) The '409 patent issued from Serial No. 903,271 filed May 5, 1976, as a continuation of Serial No. 837,957 filed September 29, 1977, as a continuation of Serial No. 702,367 filed July 2, 1976. (*Id.*) Serial No. 702,367 issued as U.S. Patent 4,606,758 (" '758"), and was a continuation-in-part of Serial No. 617,569 filed September 29, 1975 and of Serial No. 545,232 filed January 29, 1975. (*Id.*) Serial No. 617,569 issued as the

'437 patent, and Serial No. 545, 232 issued as U.S. Patent 4,002,662 (" '662"). Serial No. 545,232 [**26] was filed as a continuation of Serial No. 398,610 filed September 19, 1973, *supra*. (*Id.*) Claims 4, 5, and 6 of Re '215 are asserted here by Mobil. (*Id.*)

Re '216 issued directly from Serial No. 469,365 filed February 23, 1983 as a continuation of Serial No. 279,288 filed June 25, 1981, as an application to reissue U.S. Patent 4,164,408 (" '408"). (*Id.*) The '408 patent issued from application Serial No. 836,885 filed September 26, 1977, as a continuation of Serial No. 702,367 filed July 2, 1976, *supra*. (*Id.*) Claims 4, 5, and 6 of Re '216 are asserted here by Mobil. (*Id.*)

Finally, the '622 patent issued from Serial No. 587,973 filed March 9, 1984, as a continuation of Serial No. 490,357 filed May 2, 1987, as a continuation of Serial No. 181,491 as a continuation of Serial No. 837,957 filed September 29, 1977, *supra*. (*Id.*) Claims 1, 3, 5-9, and 11-15 of the '622 patent are asserted by Mobil. (*Id.*)

As noted above, all of the Mobil claims in suit purport to relate back through various continuation applications to the 1971 application. However, whether each or any of them is, in fact, a "continuation" application and entitled to the benefit of the February 11, 1971 [**27] filing date under the law for the purpose of avoiding intervening prior art is disputed and addressed, *infra*.

All of the Mobil claims in suit are directed to either herbicidal compounds, or compositions or methods including the compounds. Mobil employs the following structural formula for describing the compounds in all of its patents in suit:

[SEE ILLUSTRATION IN ORIGINAL]

The definitions of the variables (viz: R, X, and n) differ somewhat from claim to claim.

There are two patents asserted by Rohm and Haas, U.S. Reissue Patent 31,455 ("Re '455") issued December 6, 1983, and

[*285] U.S. Reissue Patent 31,731 ("Re '731") issued November 13, 1984. (*Id.* at paras. 4.6-4.8.)

Re '455 issued directly from Serial No. 939,292 filed September 1, 1978, to reissue U.S. Patent 4,063,929 (" '929") issued December 20, 1977. (*Id.*) The '929 patent issued from Serial No. 617,560 filed September 29, 1975, as a continuation of Serial No. 331,719 filed February 12, 1973, as a continuation-in-part of Serial No. 234,651 filed March 14, 1972. (*Id.*) Serial No. 331,719 issued as U.S. patent 3,928,416 (" '416") on December 23, 1975, and Serial No. 234,651 issued as U.S. Patent 3,798,276 (" '276") on March [*28] 19, 1974. (*Id.*) Claims 1, 2, 6, and 7 of Re '455 are asserted here by Rohm and Haas. (*Id.*)

Re '731 issued from application Serial No. 939,291 filed September 1, 1978, to reissue the '416 patent. (*Id.*) Claims 8 and 9 are asserted here. (*Id.*)

As noted, *supra*, Rohm and Haas' foreign counterpart to Serial No. 331,719, the Rohm and Haas Netherlands application, was filed on March 14, 1973, and was published September 18, 1973, in accordance with foreign practice. (RX 2099.) Whether it is prior art here with respect to the Mobil claims in suit is disputed, and as discussed *infra* depends on whether the Mobil claims are entitled to the benefit of the 1971 filing date.

The Rohm and Haas claims also are directed to herbicidal compounds, or compositions or methods involving the compounds. Rohm and Haas uses a somewhat different structural formula to describe its compounds. It uses either

[SEE ILLUSTRATION IN ORIGINAL]

As with the Mobil claims the variables (viz: X, Y and Z) are defined somewhat differently from claim to claim.

As discussed *supra*, the allegedly infringing product

is the sodium salt of acifluorfen. The compound or its intermediates fall within the chemistry [*29] of the Mobil as well as the Rohm and Haas claims. If all of the claims are valid, the parties here have blocking patents. That is, neither can practice its invention and avoid infringing the other's without a license. In fact, as noted *supra*, the parties have stipulated that certain of their activities constitute infringement if the claims asserted against them are not held invalid or unenforceable. Therefore, the Court turns first to the validity and enforceability of the claims in suit.

IV. THE VALIDITY OF THE PATENTS IN SUIT

[HN1] The parties bear a heavy burden here to prove that the patent claims asserted against them are invalid or unenforceable. Each patent in suit is presumed valid, and each claim is presumed valid independently of the other claims. 35 U.S.C. § 282; *see also Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 961, 1 U.S.P.Q.2D (BNA) 1196 (Fed.Cir. 1986). The challenger must prove facts to establish invalidity by clear and convincing evidence. *Ethicon, Inc. v. Quigg*, 849 F.2d 1422, 1427, 7 U.S.P.Q.2D (BNA) 1152 (Fed.Cir. 1988); *Hughes Tool Co. v. Dresser Indus., Inc.*, 816 F.2d 1549, 1555 (Fed. Cir.), *cert. denied*, 484 U.S. 914, 98 L. Ed. 2d 219, 108 S. Ct. 261 (1987); *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1375, 231 U.S.P.Q. (BNA) 81 (Fed.Cir. 1986), *cert. denied*, 480 U.S. 947, 94 L. Ed. 2d 792, 107 S. Ct. 1606 (1987); *American Hoist & Derrick Co. v. Sowa & Sons, Inc.*, 725 F.2d 1350, 1360, 220 U.S.P.Q. (BNA) 763 (Fed. Cir.), *cert. denied*, 469 U.S. 821, 83 L. Ed. 2d 41, 105 S. Ct. 95, 224 U.S.P.Q. (BNA) 520 (1984).

A. The Mobil Patents

Rohm and Haas challenges the validity of the Mobil patents in suit on several grounds. First, Rohm and Haas contends that none of the claims asserted by Mobil

[*286] are entitled to the filing date of the 1971 application under 35 U.S.C. § 120 (§ 120), because the claimed subject matter was not adequately disclosed in the 1971 application. (D.I. 317 at 38-39.) Therefore, Rohm and Haas argues, the Rohm and Haas Netherlands patent application published September 18, 1973, is available as prior art and renders each of the Mobil claims in suit invalid as either anticipated under 35 U.S.C. § 102 or obvious under 35 U.S.C. § 103. (*Id.* at 38.)

Second, Rohm and Haas contends that all of the Mobil claims in suit are invalid for failure to comply with the enablement requirement of 35 U.S.C. § 112 (§ 112) and the utility requirement of 35 U.S.C. § 101 (§ 101), because they embrace "a substantial number of compounds with little or no herbicidal activity" and "many of the [*31] compounds have questionable stability and cannot be synthesized at all or only after excessive experimentation." (*Id.* at 67-68.)

Finally, Rohm and Haas contends that all of the Mobil claims in suit are invalid for obviousness under § 103 over the prior art. (*Id.* at 75-76.)

In addition, Rohm and Haas contends that the claims of the '622 patent are invalid for obviousness-type double patenting over several other patents issued to Dr. Theissen, because the '622 claims are not subject to a proper terminal disclaimer. (*Id.* at 92-93.) Rohm and Haas also contends that the '622 claims are unenforceable here because in response to certain discovery requests by Rohm and Haas in these actions, Mobil failed to identify certain patent applications which led to the '622 patent. (*Id.* at 103-104.) The Court will address these arguments in turn.

1. The Mobil Claims Are Invalid In View Of The Rohm And Haas Netherlands Application

As discussed, *supra*, all of the claims asserted by

Mobil, although in fact filed later, rely on the February 11, 1971 filing date of the 1971 application under § 120. The Rohm and Haas Netherlands application was published September 18, 1973. (RX 2099 [*32] at 1.)

However, Rohm and Haas contends the Mobil claims are not entitled to the 1971 filing date, because their subject matter was not adequately disclosed in the 1971 application as required by § 120. (D.I. 317 at 38-39.) Thus, Rohm and Haas contends, the Rohm and Haas Netherlands application which specifically named and provided herbicidal data for acifluorfen and its methyl ester is § 102(b) prior art;³¹ and the Mobil claims are invalid as either anticipated under § 102 or obvious under § 103. (*Id.*)

31 [HN2] 35 U.S.C. § 102(b) provides:

A person shall be entitled to a patent unless --

* * * *

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States.

Under our patent laws the Mobil claims are entitled to the benefit of the 1971 filing date if their subject matter was disclosed in the 1971 application "in the manner provided by the first paragraph" of § 112. *See* 35 U.S.C. § 120. ³² The first paragraph of [HN3] § 112 provides that:

[*287] The specification shall contain a written description of the invention, and of [*33] the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his inventions.

35 U.S.C. § 112. Therefore, whether the Rohm and Haas Netherlands application is § 102(b) prior art with respect to the Mobil claims turns on whether their subject matter was disclosed in the 1971 application "in such full, clear, concise, and exact terms" as required by § 112. See *Kennecott Corp. v. Kyocera Int'l, Inc.*, 835 F.2d 1419, 1421, 5 U.S.P.Q.2D (BNA) 1194 (Fed. Cir. 1987), cert. denied, 486 U.S. 1008, 108 S. Ct. 1735, 100 L. Ed. 2d 198 (1988); *In re Wertheim*, 541 F.2d 257, 261, 191 U.S.P.Q. (BNA) 90 (C.C.P.A. 1976); *Martin v. Johnson*, 59 C.C.P.A. 769, 454 F.2d 746, 750, 172 U.S.P.Q. (BNA) 391 (1972); *In re Lukach*, 58 C.C.P.A. 1233, 442 F.2d 967, 968, 169 U.S.P.Q. (BNA) 795 (1971); *In re Hafner*, 56 C.C.P.A. 1424, 410 F.2d 1403, 1406, 161 U.S.P.Q. (BNA) 783 (1969); *Dyer v. Field*, 55 C.C.P.A. 771, 386 F.2d 466, 468 & n. 3, 156 U.S.P.Q. (BNA) 85 (1967); *Swain v. Crittendon*, 51 C.C.P.A. 1459, 332 F.2d 820, 823-24, 141 U.S.P.Q. (BNA) 811 (1964).

32 Prior to amendment in 1984, [HN4] 35 U.S.C. § 120 provided that:

An application for patent for an invention disclosed in the manner provided by the first paragraph of section 112 of this title in an application previously filed in the United States, or as provided by section 363 of this title, by the same inventor shall have the same effect, as to such invention, as though filed on the date of the prior application, if filed before the patenting or abandonment of or termination of proceedings on the first application or on an application similarly entitled to the benefit of the filing date of the first application and if it contains or is

amended to contain a specific reference to the earlier filed application.

35 U.S.C. § 120 (1975, later amended by Pub.L. 98-622) (emphasis added). In 1984, § 120 was amended and the emphasized language was replaced with "which is filed by an inventor or inventors named in the previously filed application." See 35 U.S.C. § 120 (as amended Nov. 8, 1984, Pub.L. 98-622, Title I, § 104(b), 98 Stat. 3385). However § 120 as amended in 1984 is applicable to U.S. patents granted on or after Nov. 8, 1984. Rohm and Haas does not challenge Mobil's compliance with the copendency, designation or inventorship requirements of § 120. Only compliance with § 112 is challenged.

[**34] The first paragraph of § 112 requires both a written description of the specific subject matter claimed and that the description enable the artisan³³ to make and use the claimed invention. See *United States Steel Corp. v. Phillips Petroleum Co.*, 865 F.2d 1247, 1251, 9 U.S.P.Q.2D (BNA) 1461 (Fed. Cir. 1989); *Uiter v. Hiraga*, 845 F.2d 993, 998, 6 U.S.P.Q.2D (BNA) 1709 (Fed. Cir. 1988); *Kennecott Corp.*, 835 F.2d at 1421; *In re Wertheim*, 646 F.2d 527, 537, 209 U.S.P.Q. (BNA) 554 (C.C.P.A. 1981); *Weil v. Fritz*, 601 F.2d 551, 555, 202 U.S.P.Q. (BNA) 447 (C.C.P.A. 1979); *Martin*, 454 F.2d at 750-52; *In re Lukach*, 442 F.2d at 968; *In re DiLeone*, 58 C.C.P.A. 925, 436 F.2d 1404, 1405, 168 U.S.P.Q. (BNA) 592 (1971); *In re Ruschig*, 54 C.C.P.A. 1551, 379 F.2d 990, 995-96, 154 U.S.P.Q. (BNA) 118 (1967). See also 2 D. Chisum, *Patents -- A Treatise on the Law of Patentability, Validity and Infringement*, §§ 7.03, 7.04 (1988). These are the so-called "written description" and "enablement" requirements.

33 The level of ordinary skill in the herbicide art did not change significantly between February 1971 and September 1975. (RX 2601, Tab A, para. 8.2.) A person having ordinary skill in the art will be referred to herein as the "artisan." The person having ordinary skill in the herbicide art throughout the period February 1971 to September 1975 would be someone with (1) a Bachelor's degree in chemistry plus at least five years of experience in the field of making and testing compounds for use as herbicides, or (2) a Master's degree in organic chemistry and at least

four years of such experience, or (3) a Ph.D.degree in organic chemistry and at least two years of such experience. The person having ordinary skill in the art also had some knowledge of commercial herbicides, had knowledge of the testing procedures used for evaluating the herbicidal effectiveness of compounds and was generally familiar with the patent and technical literature relating to herbicides. (*Id.* at para. 8.3.) A person having ordinary skill in the biological property areas involved in this case, throughout that period, would have a Ph.D.in either plant physiology, or plant pathology, or plant science, or an agronomy degree, with at least two years of experience in the evaluation of the biological properties of herbicides. In the absence of a Ph.D., such a person would have at least a Master's or Bachelor's degree in one of the above fields of study with three or more years of experience in the evaluation of the biological properties of herbicides. (*Id.* at para. 8.4.)

[**35] Mobil apparently concedes that the claims it asserts here are "subgeneric" with respect to its 1971 disclosure and were not "separately set forth" in the 1971 application. (D.I. 319 at 79, *see also* D.I. 319 at 9.) But Mobil argues that this does not mean that the claims are not adequately supported. (*Id.* at 79.)

The law is clear that to satisfy the description requirement of § 112, the subject matter of the Mobil claims need not have been described identically in the 1971 application. *In re Wilder*, 736 F.2d 1516, 1520, 222 U.S.P.Q. (BNA) 369 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 1209, 84 L. Ed. 2d 323, 105 S. Ct. 1173 (1985); *see also In re Gosteli*, 872 F.2d 1008, 1012 (Fed. Cir. 1989); *In re Wright*, 866 F.2d 422, 425, 9 U.S.P.Q.2D (BNA) 1649 (Fed.Cir. 1989); *Wagoner v. Barger*, 59 C.C.P.A. 1213, 463 F.2d 1377, 1380, 175 U.S.P.Q. (BNA) 85 (1972); *In re Schneider*, 481 F.2d 1350, 1356 (C.C.P.A. 1973); *Martin v. Johnson*, 59 C.C.P.A. 769, 454 F.2d 746, 751, 172 U.S.P.Q. (BNA) 391 (1972); *Dyer*, 386

[*288] *F.2d* at 470-71. But the 1971 application, as a whole and as originally filed, must "reasonably convey[] to the artisan" that Dr. Theissen had possession of the later claimed subject matter at the time the 1971 application was filed. *Ralston Purina Co. v. Far-Mar-Co., Inc.*, 772 F.2d 1570, 1575, 227 U.S.P.Q. (BNA) 177 (Fed. Cir. 1985); [*36] *see also In re Gasteli*, 872 F.2d at 1012 ("The description must clearly allow persons of ordinary skill in the art to recognize that . . . [the inventor] invented what is claimed."); *In re Wright*, 866 F.2d at 424 (quoting *In re Smith*, 481 F.2d 910, 914, 178 U.S.P.Q. (BNA) 620 (C.C.P.A. 1973)) ("The specification as originally filed must convey clearly to those skilled in the art the information that the applicant has invented the specific subject matter later claimed"); *Bigham v. Godtfredsen*, 857 F.2d 1415, 1417, 8 U.S.P.Q.2D (BNA) 1266 (Fed. Cir. 1988); *Martin v. Mayer*, 823 F.2d 500, 505, 3 U.S.P.Q.2D (BNA) 1333 (Fed. Cir. 1987); *In re Kaslow*, 707 F.2d 1366, 1375, 217 U.S.P.Q. (BNA) 1089 (Fed. Cir. 1983); *In re Driscoll*, 562 F.2d 1245, 1248-49, 195 U.S.P.Q. (BNA) 434 (C.C.P.A. 1977).

Therefore, each of the Mobil claims must be measured against the 1971 application. *See In re Kirchner*, 49 C.C.P.A. 1234, 305 F.2d 897, 904, 134 U.S.P.Q. (BNA) 324 (1962); *see also Kennecott Corp.*, 835 F.2d at 1422. For the Rohm and Haas Netherlands application to be § 102(b) prior art on the ground that the 1971 application did not provide a written description of the claimed subject matter, Rohm and Haas must show by clear and convincing evidence that the 1971 application did not reasonably inform the artisan that Dr. Theissen [*37] possessed the claimed subject matter when the 1971 application was filed.³⁴

34 Whether the subject matter of the Mobil claims was adequately described in the 1971 application goes to the question of whether the Rohm and Haas Netherlands application is § 102(b) prior art, and thus to the question of invalidity. Therefore, the burden on Rohm and Haas to show an inadequate description is that under 35 U.S.C. § 282. *See Ralston Purina*, 772 F.2d at 1573-74; *see also Martin*, 823 F.2d at 505; *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1570, 1 U.S.P.Q.2D (BNA) 1593 (Fed. Cir.), *cert. denied*, 481 U.S. 1052, 95 L. Ed. 2d 843, 107 S. Ct. 2187 (1987).

a. The 1971 Application

The 1971 application, as filed, had essentially 3 parts, a summary of the invention, a description of specific embodiments, i.e. examples, and the claims.³⁵ The summary of the invention consisted of the following:

This invention provides herbicidal compounds having the formula:

[SEE ILLUSTRATION IN ORIGINAL]

wherein X is a member selected from the group consisting of hydrogen, halogen [*38] (e.g., fluorine, chlorine and bromine), nitro, trifluoromethyl, cyano, COOH,

[SEE ILLUSTRATION IN ORIGINAL]

(e.g. alkyl of 1 to 4 carbon atoms), hydroxy, alkoxy of 1 to 4 carbon atoms, alkyl or 1 to 4 carbon atoms,

[SEE ILLUSTRATION IN ORIGINAL]

SH, SR[1], SOR[1], SO[2]NH[2] and combination thereof, R[1] and R[2] are selected from the group consisting of alkyl of 1 to 4 carbon atoms, R is selected from the group consisting of hydroxy, alkoxy of 1 to 5 carbon atoms, aryloxy, chloro, amido, alkylamido of 1 to 4 carbon atoms, dialkylamido of 2 to 6 carbon atoms, SH, SR[1], and OM in which M is an alkali metal (e.g. lithium, sodium and potassium), alkylammonium of 1 to 4 carbon atoms or alkanolammonium of 1 to 4 carbon atoms, *n* is an integer of 1 to 5, and in which compound at least one X is other than hydrogen; their use as herbicides; and a herbicidal composition comprising at least one of said compounds and a carrier thereof.

(JX 2522 at A3984-85; *see also* RX 2508, Tab 2, cols. 1-2.) Depending on which of

[*289] certain assumptions are used with respect to the permitted substitutions, the summary of the invention mathematically embraced somewhere between approximately 390 [*39] billion to 210 trillion substituted diphenyl ether compounds. (D.I. 286 at 2-4.) Dr. Theissen testified that the summary of the invention defined "the scope" of his invention. (Tr. at 859, 861, 862, 1380.)

35 The 1971 application also contained an abstract of the disclosure, background of the invention, and cross-reference to related applications. (JX 2522 at A3984.)

The examples consisted of specific compounds. First, there was a list of 57 compounds, so-called "nonlimiting examples." (JX 2522 at A3985-87.) The nonlimiting examples were a potpourri of compounds illustrating various specific substitutions. (See Tr. at 1771-72.) The list was preceded by a method for preparing the listed compounds which involved the so-called "Ullman ether synthesis" reaction between the salt of "a suitable substituted phenol" and a 5-halo-2-nitro benzoic acid or an ester, amide, or salt thereof. (*Id.* at A3985; see also Tr. at 1715-17.) ³⁶ Most of the nonlimiting examples were embraced by the summary of the invention, ³⁷ but no data were provided for any of them.

36 Dr. John Roberts, an expert chemist called by Rohm and Haas, see note 47 *infra*, testified that the 1971 application did not describe "the classical Ullman reaction" because most such reactions "are run with a copper catalyst" which was not described in the application. (Tr. at 1717.)

[**40] 37 Several of the nonlimiting examples were not within the summary of the invention. (See Tr. at 1758-61.) The Court finds that the artisan would have recognized this, and concluded that they were inconsistent with the disclosure.

Second, there were 26 compounds actually synthesized and tested by Mobil, including procedures for the syntheses and physical or spectroscopic data purporting to confirm their identities. (*Id.* at A3987-90.) These were the so-called "working examples."

Third, there were six so-called "comparative examples." (JX 2522 at A3990-91.) These were "position isomers" of the first four working examples, ³⁸

purportedly to show by comparison the superior herbicidal activity of the working examples. (*Id.* at A3991.) The comparative examples were numbered to correspond to the first four working examples, i.e. 1a, 2a, 2b, 3a, 3b, 4a, 4b. They were identical to the corresponding working examples with respect to the identity, number, and position of substituents on the cyclic portion of the "phenoxy" moiety, known here as the right hand ring, ³⁹ but differed with respect to the relative positioning of the COR, NO₂ and substituted phenoxy groups on the [*41] left hand ring. (Tr. at 1429-34.) The application stated that:

The compounds embodied herein in which the nitro group is in the . . . [4] position and the substituted phenoxy group is in the [1']-position exhibit markedly higher effectiveness as herbicides than do the comparable compounds in which the nitro group and the substituted phenoxy group are in different positions.

(JX 2522 at A3991.)

38 An "isomer" is one of two or more compounds which have the same molecular formula, but differ in structure. (D.I. 285 at 7; see also Tr. at 79.)

39 "Phenoxy" is an "aryloxy radical of the following formula:

[SEE ILLUSTRATION IN ORIGINAL]

(D.I. 285 at 19.) The cyclic portion of the "phenoxy" moiety provides the right hand ring of a diphenyl ether compound. (Tr. at 105.)

Finally, herbicidal data were provided and tabulated for the working and comparative examples as applied to a variety of weeds at given rates according to a given protocol. (*Id.* at A3992-99.)

There were 39 claims filed with the application. (JX 2522 at A4000-4004.) ⁴⁰ Claim 1 was the broadest and "essentially correspond[ed]" to the summary of the invention. (D.I. 319 at 84; Tr. at 1821.) Claims 2-13 [*42] were dependent on Claim 1, and were each directed to a different specific compound

[*290] embraced by Claim 1. Ten of the twelve compounds had all halogen right hand ring substitutions, one had a combination of chlorine (Cl, a halogen) and methyl (an alkyl), and one had a combination of nitro (NO₂) and trifluoromethyl (CF₃). Claims 14-26 were directed to methods "for combatting undesirable herbs" with the compounds of Claims 1-13, and Claims 27-39 were directed to herbicidal compositions "comprising at least one compound" from Claims 1-13 and "a carrier." ⁴¹

40 Although the original claims filed with the 1971 application were not allowed they were nonetheless part of the disclosure. *In re Rasmussen*, 650 F.2d 1212, 1214 n. 5, 211 U.S.P.Q. (BNA) 323 (C.C.P.A. 1981); *In re Anderson*, 471 F.2d 1237, 1238, 176 U.S.P.Q. (BNA) 331 (C.C.P.A. 1973).

41 A "herbicide carrier" as used herein is a gas, liquid, or solid substance used to dilute or suspend a herbicide to assist in its application. (D.I. 283, Tab 3B, Appendix A at 3; *see also* Tr. at 204.)

Thus, the disclosure embodied by the 1971 application consisted essentially of a broad structural formula with several variable substituents as set forth in the summary of the [*43] invention (and Claim 1) which covered a very broad class or genus of compounds on one hand, and nearly 100 specific compounds some of which were tested as set forth in the examples and claims on the other.

b. The '437 Claim

Claim 1 of the '437 patent is asserted against Rohm and Haas. (D.I. 283, para. 9.6.) Claim 1 is:

[SEE ILLUSTRATION IN ORIGINAL]

R is hydroxy, alkoxy of 1 to 4 carbon atoms, or phenoxy; X is halogen or trifluoromethyl and at least one X is halogen and another is trifluoromethyl; and n is 2 to 5.

(RX 2508, Tab 4, col. 8.)

Claim 1 differs from the broad class of compounds contained in the summary of the invention (and Claim 1) of the 1971 application in several respects. The definition of "R" is narrower. It is limited to "hydroxy, alkoxy of 1 to 4 carbon atoms, or phenoxy." The definition of "X" is also narrower. It is limited to "halogen or CF₃], and

there must be at least one halogen and at least one CF₃] on the right hand ring". The number of right hand ring substituents in Claim 1, "n," is "2 to 5" as opposed to "1 to 5."

As thus defined, no working example is embraced by Claim 1 (Tr. at 1767; *see also* Tr. at 638-43, 2658), and only one [*44] of the 57 nonlimiting examples, methyl 2'-nitro-1'-[4 chloro-2-trifluoromethyl phenoxy] benzoate (IX 2522 at A 3986), the so-called "reverse isomer" of acifluorfen methyl ester, ⁴² is. (Tr. at 1773; *see also* Tr. 2041-42; 2535-36; 2658-59.) Furthermore, while Claim 1 of the '437 patent is subgeneric to Claim 1 of the 1971 application, none of the specific compounds claimed in 1971 is embraced by Claim 1 of the '437 patent.

42 Acifluorfen methyl ester is the methyl ester analog of acifluorfen. (D.I. 285 at 35.) That is the "R" group is methoxy. (*See id.* at 27; *see also id.* at 21.) The so-called "reverse isomer" is a positional isomer of acifluorfen methyl ester. (Tr. at 758.) That is, the positions of the chlorine and trifluoromethyl substituents are reversed on the right hand ring of the molecule. (*Id.*) From time to time this compound was referred to as the "reverse isomer." (*See, e.g.*, Tr. at 758-59, 1482.) The Court will also refer to it as such for ease of reference only and without intending to attach any chemical or legal significance to the designation beyond that explained here.

i. Description of the '437 Claim in the 1971 Application

The Court [*45] finds that Rohm and Haas has shown by clear and convincing evidence that the 1971 application did not reasonably inform the artisan that Dr. Theissen had possession of the subject matter of Claim 1 of the '437 patent in 1971. More particularly, the limitation with respect to substitution of the right hand ring that "X is halogen or trifluoromethyl and at least one X is halogen and another is trifluoromethyl" was not disclosed in the manner provided by § 112. ⁴³

43 The Court's conclusion with respect to the inadequacy of support for the definition of "X" in Claim 1 makes it unnecessary to specifically consider whether the several definitions of "R" and "n" in Claim 1 are supported by the 1971 application.

[*291] The 1971 application described a very broad class of substituted diphenyl ether compounds characterized under one convention of nomenclature as "2-nitro-5-(substituted-phenoxy) benzoic acids, and esters, salts, amides, and acyl halides thereof." (JX 2522 at A3983; Tr. at 1433-34; *see also* D.I. 319 at 25, 42.) Whether a compound was an acid, ester, salt, amide or acyl halide depended on the particular "X" "member" selected. (Tr. at 58-66; *see also* D.I. 285 at 25, 27, [*46] 9, and 30.) Substitution of the right hand ring was limited to substituents embraced by the 16 enumerated "X" "members." 44

44 With "X" "member" the Court refers to a "member" of the "group" referred to in the summary of the invention in the 1971 application, viz: hydrogen, halogen (e.g. fluorine, chlorine and bromine), nitro, etc. Thus, there are 16 "members" of this "group." It should also be noted that many of the "members," in fact, themselves embrace more specific substituents. The parties have stipulated that depending on which of certain assumptions are employed with regard to certain "members," there are actually somewhere between 96 and 278 different substituents embraced by the definition of "X" in the 1971 summary of the invention. (*See* D.I. 286 at 2-4.) For example, the member "halogen" embraces chlorine, fluorine, etc. (*See* Tr. at 1771-72; *see also* D.I. 285 at 9, 20, 22.)

The focus of the application was on the relative positioning of the COR, NO[2] and substituted phenoxy on the left hand ring of the compounds embraced by the broad class. The testimony of the inventor Dr. Theissen, who was himself skilled in the art in 1971, made clear to the Court [*47] that his interpretation of the 1971 application was that its focus was on the particular relative positioning of these groups on the left hand ring. (Tr. at 879-81, 899-900, 901-902, 912; *see also* Tr. at 941, 955, 958, 1429-34, 1446, 1535-46, 1650-50A.) 45 But the 1971 application did not provide any more guidance to the artisan for substitution of the right hand ring than the group of members from which substituents were selected and the specific compounds illustrating specific substitutions.

45 Dr. Theissen's effort to define the herbicidal activities of compounds within the scope of his invention, as disclosed in the 1971 specification,

as a relative concept, viz: that no matter how minimal the activity of a compound it was nonetheless herbicidally active within the context of his invention because its activity would be less if the relative positions of the NO[2], COR and substituted phenoxy groups on the left hand ring were different (*see, e.g.,* Tr. at 879-81, 899-900, 901, 902, 1434, 1492, 1446, 1482, 1535-46, 1650-50A), was yeomanly although at times incredible. However, it made clear to the Court that Theissen's own interpretation of the disclosure was that the focus was on the relative positioning on the left hand ring. (*See, e.g.,* Tr. at 1460 (when Dr. Theissen saw the abstract of the Rohm and Haas Netherlands application he "was highly concerned" that someone was "trying to take and look at 3-prime-carboxy-4-prime-nitro compounds").) The Court notes that Theissen's subjective intent is not considered relevant with regard to the description contained in the 1971 application. Rather, Theissen was, himself, skilled in the art when the 1971 application was filed (Tr. at 1043), and his interpretation of the application's focus is amply supported.

[**48] All of the expert testimony established clearly and convincingly to the Court that the artisan would not have understood from the 1971 application, that in 1971, Dr. Theissen had possession of the subject matter of any of the claims asserted here. The expert testimony was that the information provided by the 1971 application was either too general (as with the summary of the invention) or too specific (as with the specific named compounds) for the artisan to derive the subclasses of compounds defined by any of the Mobil claims in suit. (*See* Tr. at 1754-55, 1783-84, 2042-45, 2056.) On the one hand there was a very broad class of compounds consisting of the various and many permutations permitted within the summary of the invention. (*See* Tr. at 1766; 2056.) On the other hand the examples and claims consisted of nearly 100 specific compounds illustrating nearly as many different right hand ring substitutions. (Tr. at 1771-73, 2056.) But the differences in the electronic and chemical properties of the illustrated "X" substituents were so varied that the artisan was left without any direction with regard to their combinations. (*See* Tr. at 1778-79; *see also* Tr. at 1582-84.) [**49] There were no preferences, guideposts or directions for the subject matter now claimed (Tr. at 1755-61, 1778, 2044-45, 2051, 2053-54, 2620), no

working examples within any of

[*292] the claims asserted (Tr. at 638-43), and very few illustrations of combinations of substituents permitted by any of the asserted claims (Tr. at 1771-73, *see also* Tr. at 1778-79.) Moreover, the artisan would have had no direction to just combine or recombine substituents illustrated by the summary of the invention and the named compounds in order to arrive at the conclusion that Dr. Theissen possessed different compounds or subgenera of the broad genus. (*See* Tr. at 1771; *see also* Tr. at 2054.)

Even the testimony of Mobil's own expert chemist, Dr. Gustave Kohn,⁴⁶ was that there was no more particular description of any of the subclasses of compounds embraced by the Mobil claims than that provided by the summary of the invention. (Tr. at 2647-55.) "I would say that there is a written description if in a legal sense the generic patent can be considered a written description. That is all I am saying." (Tr. at 2655.) In this regard Dr. John Roberts, an expert chemist called by Rohm and Haas,⁴⁷ testified [*50] that the comparative examples supported the relative positioning of the NO[2], COR, and substituted phenoxy groups on the left hand ring as described in the summary of the invention (Tr. at 1755; *see also* Tr. at 1814-16), but that "virtually any combination" of substituents within the named "X groups" could be on the right hand ring. (Tr. at 1784; *see also* Tr. at 1748.)⁴⁸ The artisan would have understood that the right hand ring could have one or up to five substituents at any available position (Tr. at 382, 1748; *see also* Tr. at 115-116), and that the substituent(s) could be selected from any of the "members" enumerated in the summary of the invention at any position on the ring (Tr. at 383, 669, 859-63, 1701-04, 1748, 1754-55, 1784, 1949, 2056.) The inclusion of "hydrogen" as an "X" member and the proviso that "at least one X is other than hydrogen" (JX 2522 at A 3984-A 3985) would have made clear to the artisan that except for this proviso there were no limitations with respect to substitution of the right hand ring from the named members.

46 At the time of trial Dr. Kohn had approximately 40 years' experience in industrial chemistry, as a research chemist, manager and consultant. In 1987, Dr. Kohn was the Vice Chairman and Chairman-elect of the Pesticide Division of the American Chemical Society. (MX 2461)

[**51]

47 At the time of trial, Dr. Roberts was a

Professor of Chemistry Emeritus at the California Institute of Technology where he had been since 1953. Dr. Roberts has also been a consultant for a number of companies since 1949. (*See* RX 2506.)
48 Dr. Roberts also testified, very convincingly, that, in fact, some combinations of substituents permitted by the disclosure would be uncomfortable fellows on the right hand ring. That is, for example, the formation or existence of a compound having very bulky substituents occupying adjacent positions on the right hand ring would be sterically hindered. (*See* Tr. at 1704-1725.) However, at the same time, Dr. Roberts' testimony and informative model-assisted demonstrations of these concepts convinced the Court that the artisan would have, in 1971, recognized these concepts and problems associated with making some of the permitted compounds. "These models," Dr. Roberts testified, "were originally designed by Linus Pauling following some earlier models that had been made in England. Linus' contribution to this was to contribute a great deal to their general use and also to help define the sizes and shapes. These are very, very widely used, especially nowadays, in biochemistry, where you have enormous molecules, and you want to find out how they fit together and . . . what their bulk properties are, just due to physical size. They are excellent for that purpose. . . . In general, as far as size and shape away from the bond where they are connected, I think . . . [they are] fairly accurate." (Tr. at 1678-79.) *Cf. In re Skrivan*, 57 C.C.P.A. 1201, 427 F.2d 801, 806, 166 U.S.P.Q. (BNA) 85 (1970) ("claims need not recite. . . factors where one of ordinary skill in the art, to whom the specification and claims are directed, would consider them obvious"); C.L. Gholz, *Recent Developments in the CCPA Relating to the First Paragraph of 35 U.S.C. § 112*, 55 J.Pat.Off.Soc'y 4, 19-22 (1973).

[**52] Claim 1 of the '437 patent carves out a subgenus from the broad genus wherein "X" may be selected from only halogen and trifluoromethyl, and the right hand ring *must* have a combination of at least one halogen and one trifluoromethyl. Indeed halogen and trifluoromethyl were among the 16 "X" "members" described in the broad genus, and combinations of "members" were permitted. (*See* Tr. at 127, 1949.)

Moreover, there were compounds named having halogen substituents and

[*293] compounds named having trifluoromethyl substituents. But the 1971 application did not convey to the artisan the information that Dr. Theissen possessed the narrower class meted out by Claim 1, and more particularly its limitations with respect to a required combination of right hand ring substituents. (Tr. at 1754-55, 1783-84, 2042-45, 2056; *see also* Tr. at 175, 383.)

One of the nonlimiting examples, the reverse isomer, is embraced by Claim 1, and the subject matter of Claim 1 is embraced by the 1971 summary. But this did not *ipso facto* describe the subject matter of Claim 1 to the artisan. *See In re Smith*, 59 C.C.P.A. 1025, 458 F.2d 1389, 1395, 173 U.S.P.Q. (BNA) 679 (1972); *see also In re Lukach*, 442 F.2d at 970. Rather, the [*53] reverse isomer was part of the disclosure which must have provided a description of the claimed subject matter in some way to the artisan.

Here, the reverse isomer is one of over 42,000 compounds embraced by Claim 1 (D.I. 286 at 4),⁴⁹ and chlorine is but one substituent embraced by halogen.⁵⁰ Furthermore, the reverse isomer has only two right hand ring substituents in one of many permitted configurations, and Claim 1 embraces compounds with up to 3 more halogen or trifluoromethyl substituents. Save coincidence, each of the 42,000 compounds embraced by Claim 1 is chemically distinct, and has different chemical and physical properties. (*See* Tr. at 73-74.) The testimony and evidence made clear to the Court that the identity, number, and position of substituents on the right hand ring of a diphenyl ether compound are, as they were in 1971, critical to the chemical and physical properties of the compound (Tr. at 73-74, 107-109, 833-34, 1090, 1097-98; *see also* Tr. at 396, 1351-58, 1778-79, 2583), and that the herbicidal activity of a compound with a given substitution was not predictable. (Tr. at 395-96, 398-409, 400-402, 424-426, 1037-42, 1062-73, 1090, 1920-43, 2072-75, 3320-23; [*54] *see also* RX 2089; HX 1603; D.I. 319 at 140-41.) No data were provided for the reverse isomer. It was merely listed among the potpourri of nonlimiting examples. As discussed above there was no direction for the artisan to combine and recombine substituents to

arrive at a subgenus. (*See also* Tr. at 1771, 2054.) Therefore, the Court finds that the artisan would not have arrived at the subject matter of Claim 1 from the reverse isomer. (*See* Tr. at 1780-81.)

49 The parties have stipulated that with respect to the generic chemical structure found in Claim 1 of the '437 patent, if "X" represents 5 possible substituents and "R" represents 18 possible substituents, the total number of compounds mathematically embraced by Claim 1 is 42,336. (D.I. 286 at 4).

50 Even if the definition of halogen embraced only fluorine, chlorine and bromine, the examples listed in the 1971 specification (*see* JX 2522 at A 3984, A 3985), the permutations available under Claim 1 are readily apparent. However, the artisan would consider halogen to include fluorine, chlorine, bromine, iodine, and astatine. (*See* D.I. 285 at 9; *see also* D.I. 286 at 4.)

The claims in the 1971 application [*55] did not provide any more guidance. While Claim 1 essentially corresponded to the summary of the invention, the narrower claims were directed to *single specific compounds*, and none of the compounds is embraced by any of the Mobil claims in suit including Claim 1 of the '437 patent. (*See* JX 2522 at A4000-02.) Furthermore, there were no claims of intermediate breadth directed to subgenera.

For the foregoing reasons the Court concludes that Rohm and Haas has proved that the artisan would not have understood that Dr. Theissen possessed the subject matter of Claim 1 from the broad class of compounds, the examples, and the claims.

Mobil makes several arguments in rebuttal. First, Mobil argues that neither "preferences" nor a "working example" or "named compound" is required "in order to have support for subgeneric claims." (D.I. 319 at 79-80.)⁵¹ But even accepting this position, *arguendo*, does not persuade the Court to reach a conclusion different from that reached above. While the precise way

[*294] in which an application described later claimed subject matter may be, to some extent, unimportant, *see In re Wertheim*, 541 F.2d 257, 262, 191 U.S.P.Q. (BNA) 90 (C.C.P.A. 1976); *In re Smith*, 481 F.2d 910, 914, [*56] 178 U.S.P.Q. (BNA) 620 (C.C.P.A. 1973); *accord In re Wright*, 866 F.2d at 424-25, the application must nonetheless somehow provide a written description. *Flynn v. Eardley*, 479 F.2d 1393, 1395, 178 U.S.P.Q. (BNA) 288 (C.C.P.A. 1973). *See also* 35 U.S.C. §§ 112, 120. Here, the Court concluded, *supra*, there was clear and convincing evidence that the 1971 application did not provide a written description of the later claimed subject matter.

51 It is noteworthy that in a "trial memorandum" submitted to the Court by Mobil styled "Preferences and the Written Description Requirement of 35 U.S.C. § 112," (D.I. 291), Mobil concedes that "preferences are relevant in the absence of literal support." (*Id.* at 1.)

Mobil next relies heavily on *In re Driscoll*, 562 F.2d 1245, 195 U.S.P.Q. (BNA) 434 (C.C.P.A. 1977), arguing that *Driscoll* held "that where . . . 'the exact subgenus claimed is clearly discernible in the generalized formula,' the subgeneric Markush claims are supported." 52 (D.I. 319 at 90.) The claims, Mobil contends, are "subgeneric to the generic Markush claim filed . . . in 1971," and that, therefore, under *Driscoll* Claim 1 satisfies "the 'written description' requirement . . . because the exact subgenus . . . [*57] [claimed] 'is clearly discernible in the generalized formula' in Mobil's 1971 application." (*Id.* at 84.)

52 The so-called "Markush group" was coined following a Patent Office case styled *Ex parte Markush*, 1925C.D. 126 (Comm'r Pat. 1924). It is employed to describe a class of chemical compounds in terms of a structural formula having substituents defined as "a member selected from a group consisting of A, B, C, D, etc. . . ." *See generally* 2 D. A *Treatise on the Law of Patentability, Validity and Infringement*, § 8.06[2] at 8-99 to 8-121 (1988). "It is generally understood that in thus describing a class of compounds an applicant is, in effect, asserting that the members of the Markush group do not fall within any recognized generic class, but are alternatively usable for the purposes of the invention, and therefore, regardless of which of the alternatives is substituted on the basic structure, the compound as a whole will exhibit the disclosed utility." *Driscoll*, 562 F.2d at 1249.

Mobil parrots the "clearly discernible" language from *Driscoll* as though it were a special standard for compliance with the § 112 description requirement applicable [*58] to the type of claims and disclosure at issue here. Mobil's position apparently is that *Driscoll* stands for the proposition that describing a class of compounds by use of "Markush groups" is the equivalent, for purposes of § 112, of describing any subgenus embraced so long as the several "members" of the "Markush groups" of the subgenus are "clearly discernible." 53 The Court does not read *Driscoll* as so holding, and in any event is unpersuaded that that is or should be the law. 54 However

[*295] significant the "clearly discernible" language may have been to the Court's holding in *Driscoll*, this Court concludes, in accordance with its discussion of the law, *supra*, that the standard for compliance with the written description requirement is the same without regard for the form of the claim or disclosure, that is, whether the 1971 application reasonably conveyed to the artisan the information that Dr. Theissen possessed the specific subject matter of the later claims. *See also Driscoll*, 562 F.2d at 1248-49. As the Court concluded, *supra*, the artisan would not have understood that Theissen possessed the subject matter of Claim 1 from the 1971 application.

53 But cf. 2D S. Chisum, *A Treatise on the Law of Patentability, Validity and Infringement*, § 7.04[3] at 7-60 n. 7 (1988). Professor Chisum comments that *Driscoll* stands for the proposition that "if an applicant describes a class of elements by use of a Markush or similar group . . . that description may be taken as an adequate description of the combination with each or a limited number of the Markush group members The Markush group is viewed as an implied statement of interchangeability of the group members for purposes of the invention." (Citation omitted.)

[**59]

54 Under our laws the filing of a patent application is a "constructive reduction to practice" of whatever the application discloses in the manner provided by § 112. *Hazeltine Corp. v. United States*, 820 F.2d 1190, 1196, 2 U.S.P.Q.2D (BNA) 1744 (Fed. Cir. 1987); *Hybritech*, 802 F.2d at 1376; *In re Lundak*, 773 F.2d 1216, 1222-23, 227 U.S.P.Q. (BNA) 90 (Fed. Cir. 1985); *In re Katz*, 687 F.2d 450, 454, 215 U.S.P.Q. (BNA) 14 (C.C.P.A. 1982); *Weil v. Fritz*, 572 F.2d 856, 865 n. 16, 196 U.S.P.Q. (BNA) 600 (C.C.P.A. 1978); *see also* 3 D. Chisum, *A Treatise on the Law of Patentability, Validity and Infringement*, § 10.05[1] at 10-74 (1988). For this an inventor may be entitled to the filing date of this application for claims which are, in fact, filed well after the application. *See* 35 U.S.C. § 120; *see also In re Henriksen*, 55 C.C.P.A. 1384, 399 F.2d 253, 261, 158 U.S.P.Q. (BNA) 224 (1968) (so long as § 120 is complied with, there is no limit on the number of applications that may relate back). This is so without regard for what

becomes evident to the inventor or the art after the patent application relied on was filed. *Cf. United States Steel Corp.*, 865 F.2d at 1251-52. It is apparently of no moment that what turns out to be adequate support under § 120 (and thus § 112) may have been, in fact, guesswork, speculation or fortune. *But cf. Snitzer v. Etzel*, 59 C.C.P.A. 1242, 465 F.2d 899, 902-03, 175 U.S.P.Q. (BNA) 108 (1972) ("It may be that were boundless speculation evident, a different result would be reached.").

As such, the prosecution of applications directed to chemical compounds is, in this Court's view, particularly subject to abuse and the extension of unwarranted priority. A general description of a class of chemical compounds which employs one or more variable substituents corresponding to lists of candidates which can be variously combined can embrace a practically limitless number of compounds. Some time ago one commentator recognized the ease with which lists of chemical compounds could be generated for purposes of a patent application:

The obvious danger inherent in the current interpretation of the description-of-the-invention requirement of the statute is that it could lead to rampant, socially dysfunctional "paper chemistry" and the equivalent in other arts. With the present capability of business machines, it is relatively simple to go from a structural formula reading on tens of thousands of chemical compounds to a printout naming the compounds individually. If the generic element in question is a temperature or pressure range, a range in ingredient proportion, or the like, it is even easier to recite mechanically legions of subgeneric descriptions drawn to narrower ranges or specific values within the generic range.

Gholz, *Recent Developments in the CCPA Relating to the First Paragraph of 35 U.S.C. §*

112, 54 J.Pat.Off.Soc'y, 768, 787-88 (1972). Several of the patents in suit, in fact, embrace quadrillions, trillions or billions of compounds. (See generally D.I. 286.) However, as was made clear at trial, it would be virtually impossible for an inventor, or anyone, to ever, in fact, confirm (or rebut) the utility of every compound embraced by disclosures and claims such as are at issue in this case. See also *Lear, Inc. v. Adkins*, 395 U.S. 653, 670, 23 L. Ed. 2d 610, 89 S. Ct. 1902 (1969) ("the Patent Office is often obliged to reach its decision [regarding patentability] in an *ex parte* proceeding, without the aid of the arguments which could be advanced by parties interested in proving patent invalidity."); T.A. Waltz, *Markush to Date*, 62 J.Pat.Off.Soc'y 382, 384 (1980). In fact, Mobil stipulated that as of the filing date of the 1971 application no compound had been synthesized at Mobil that would fall within any of the claims it asserts here. (Tr. at 1765.) While chemistry abounds with theory, the empirical still plays a vital role, particularly to the art at issue here. (Tr. at 1943.) See also *In re O'Farrell*, 853 F.2d 894, 903, 7 U.S.P.Q.2D (BNA) 1673 (Fed. Cir. 1988).

The Court recognizes the competing policies of encouraging early dedication of worthy inventions to the public on one hand, and discouraging the filing of incomplete "flashes in the pan" on the other. *cf. UMC Electronics Co. v. United States*, 816 F.2d 647, 660-61, 2 U.S.P.Q.2D (BNA) 1465 (Fed.Cir. 1987) (Smith, J., dissenting), *cert. denied*, 484 U.S. 1025, 98 L. Ed. 2d 761, 108 S. Ct. 748 (1988); and that Congress has, by § 120, entitled inventors to rely on the filing dates of earlier applications for later

claims. But the law provides that the *quid pro quo* entitling inventors to reach back for priority is an adequate antecedent disclosure. See 35 U.S.C. § 120; see also *Kingsdown Medical Consultants, Ltd. v. Hollister, Inc.*, 863 F.2d 867, 874, 9 U.S.P.Q.2D (BNA) 1384 (Fed.Cir. 1988), *cert. denied*, 490 U.S. 1067, 109 S. Ct. 2068, 104 L. Ed. 2d 633 (1989). *Cf. Bonito Boats Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 109 S. Ct. 971, 977-78, 103 L. Ed. 2d 118 (1989). As such, compliance with § 112 cannot be read as a hollow requirement, lest inventors be allowed to later monopolize what they have not disclosed, and have never possessed. See *In re Wands*, 858 F.2d 731, 741, 8 U.S.P.Q.2D (BNA) 1400 (Fed. Cir. 1988) (Newman, J., concurring part, dissenting in part). Therefore, the Court is unprepared to countenance the application of what may amount to a less stringent standard than that generally applied for judging compliance with the description requirement where an inventor has later carved out a subgenus from what he originally disclosed in the manner at issue here.

[**60] Moreover, the facts in *Driscoll* are readily distinguishable from this case.⁵⁵ In *Driscoll* the applicant sought to rely on an earlier application under § 120, as in the present case. The earlier application disclosed the following molecular structure:

[SEE ILLUSTRATION IN ORIGINAL]

Id. at 1247. Separate definitions were provided for R, R[1], R[2], R[3], and X. See *id.* The definitions each included several choices. The definition for R was:

[*296] R is selected from the group consisting of H, alkyl (C[1]-C[6]), haloalkyl (C[1]-C[6]), cycloalkyl (C[3]-C[6]), halocycloalkyl (C[3]-C[6]), alkoxy, alkoxyalkyl, alkoxyalkylthio, aryl, substituted aryl, alkenyl (C[2]-C[6]), alkylthio (C[1]-C[6]), alkylsulfoxide (C[1]-C[6]), and alkylsulfonyl (C[1]-C[6]).

Id. "The only difference" between the disclosure relied on . . . and the later claim was that the later definition of "R" was "simply alkylsulfonyl (C[1]-C[6]), whereas in the earlier application, A correspond [ed] to a Markush group of fourteen variable substituents . . . one of which . . . [was] alkylsulfonyl (C[1]-C[6])." *Id.* at 1249.

55 As noted by *Driscoll* and echoed in more recent decisions, each case involving the question of compliance with the description requirement of § 112 "must be decided on its own facts," and, thus, "the precedential value of cases in this area is extremely limited." *Driscoll*, 562 F.2d at 1250; see also *Ralston Purina*, 772 F.2d at 1575; *In re Wilder*, 736 F.2d at 1520.

[**61] The Court held that the later claim was adequately supported by the earlier application, but relied heavily on a statement in the earlier application that:

Particularly effective [herbicides] are [thiadiazole ureas] which contain an organic substituent in the 5-position of the thiadiazole portion.

See *id.* ⁵⁶ The Court stated:

The focus [of the earlier application] is unquestionably on the substituents at the 5-position of the thiadiazole moiety, and not on the substituents of the urea moiety. Accordingly, one skilled in the art would regard the structural formula of . . . [the earlier application] as signifying that no matter which member of the R group is present on the thiadiazole moiety, the urea moiety may be substituted or unsubstituted.

Id. The Court found that the artisan would have recognized "fourteen distinct classes of compounds [from

the earlier application], each class having a single member of the A group at the 5-position of the thiadiazole moiety and variable substituent groups on the urea moiety." *Id.* The later claim was directed to one of these classes, and was thus found to be adequately described. *Id.*

56 "R" is the substituent at the 5-position of the thiadiazole portion of the generic structure. See *Driscoll*, 562 F.2d at 1247 n. 4.

[**62] This Court finds nothing in the 1971 application regarding compounds where "X" is limited to "halogen and trifluoromethyl and at least one X is halogen and another is trifluoromethyl," which is the equivalent of the statement relied on in *Driscoll*. (See also Tr. at 1771-73 (no guidance or preference for subject matter of any claim asserted here by Mobil).) In fact as discussed, *supra*, there was clear and convincing evidence that there was *no* guidance or direction for the artisan to arrive at any of the later claimed subgenera. Even the testimony of Mobil's own expert, Dr. Kohn, supports the absence of any more particular guidance than that provided by the summary of the invention. (Tr. at 2647-55; see also Tr. at 2620-21.) Rather, as the Court found, *supra*, the focus of the 1971 application was on substitution of the left hand ring and its required combination, *not* substitution of the right hand ring. As one commentary has aptly noted:

While . . . we have no difficulty with . . . [the] holding of the court [in *Driscoll*], the court's heavy reliance on the parent application disclosure focusing on the critical variable in question limits the precedential [**63] value of *Driscoll* and therefore makes its admonition on *Section 112* decisions in general particularly appropriate.

2 M.J. Adelman et al, *Patent Law Perspectives*, § 2.9 [2.-3-1] at 2-1060 to 1061 (2d ed. 1989).

Furthermore, in *Driscoll*, the narrowed definition was for substitution at a *single* position, the 5-position of the thiadiazole moiety. The 5-position could be substituted by one group at a time. In the present case the definition of "X" is for substitution of up to 5 positions. 57 Moreover, Claim 1 not only narrows the definition but also requires a combination of at least two substituents. ⁵⁸

Therefore, while in *Driscoll*

[*297] a given compound (or class of compounds) would have one member of the group substituted at the 5-position of the thiadiazole moiety, a given compound in the present case can have any one of many permutations of combinations of substituents on the right hand ring. The artisan was, in 1971, confronted with many permitted combinations and five positions for substitution.

57 As the Court found, *supra*, the identity, positioning and number of substituents on the right hand ring is critical to the properties of a compound.

58 Mobil itself acknowledges the significance of its later limitations. In response to Rohm and Haas' argument that the Mobil claims are obvious, Mobil states: "Mobil's claims limit the chemical groups that can be present on the right hand ring . . . [and that] Mobil's claims do more than just limit the chemical groups that are permitted on the right hand ring. The claims of the '215, '216 and '622 patents require a 'combination of members' must be present on the right hand ring. The expression 'combination of members' means that the right hand ring must contain at least *two different members* which are selected from the permissible substituents recited in the claims. Claim 1 of the '437 patent also requires at least two different members because it specifies that "at least one X is halogen and another is trifluoromethyl." (D.I. 319 at 137-38.)

[**64] Mobil next cites *In re Johnson*, 558 F.2d 1008, 1019, 194 U.S.P.Q. (BNA) 187 (C.C. P.A. 1977), for the proposition that "the 'factual context' out of which the written description issue arises is also relevant." (D.I. 319 at 86.) Mobil contends that it "was forced to submit subgeneric Markush claims because the . . . [Patent Office] kept requiring a restriction or division of Mobil's generic Markush claims under 35 U.S.C. § 121. . . . ["§ 121"], and that] t his occurred in the two parent applications for the '437 patent (the applications for the '635 and '830 patents)." (*Id.*)⁵⁹ Mobil, thus, argues that since the Patent Office caused "fragment[ation]" of "the generic Markush claims," "Mobil should not now be penalized for complying with the . . . [Patent Office's] requirements." (*Id.*)

59 [HNS] 35 U.S.C. § 121 provides that:

If two or more independent and

distinct inventions are claimed in one application, the Commissioner may require the application to be restricted to one of the inventions. If the other invention is made the subject of a divisional application which complies with the requirements of section 120 of this title it shall be entitled to the benefit of the filing date of the original application. A patent issuing on an application with respect to which a requirement for restriction under this section has been made, or on an application filed as a result of such a requirement, shall not be used as a reference either in the Patent and Trademark Office or in the courts against a divisional application or against the original application or any patent issued on either of them, if the divisional application is filed before the issuance of the patent on the other application. If a divisional application is directed solely to subject matter described and claimed in the original application as filed, the Commissioner may dispense with signing and execution by the inventor. The validity of a patent shall not be questioned for failure of the Commissioner to require the application to be restricted to one invention.

[**65] The short answer to Mobil's argument was succinctly put by the court in *Johnson*, "insufficiency under § 112 . . . [can] not be cured by citing the causes for such insufficiency." *Johnson*, 558 F.2d at 1019. To the extent *Johnson* held that the facts relating to the prosecution of a claim were properly presented and relied on these with respect to the description of a subgenus under § 112, the "factual context" there has no application to Claim 1 of the '437 patent.

Johnson involved later claims in a continuation-in-part application which were subgeneric to

broad claims contained in an earlier application relied on for priority. The earlier application described and claimed "in haec verba" a genus of linear polymers, and contained twenty-six examples "disclosing in detail the physical and chemical characteristics of fifteen species." *Id. at 1011-12*. The later claims were subgeneric only in that they contained a proviso excluding two species lost in an interference from among the fifteen specifically disclosed in the earlier application.⁶⁰ Otherwise, the earlier and later claims were identical.

60 Only one species was actually the subject of the lost interference count, but another was determined to be patentably indistinct from it.

[**66] The court reversed the Board of Appeals conclusion that there was no antecedent basis for the later claims, stating that:

The notion that one who fully discloses, and teaches those skilled in the art how to make and use, a genus and numerous species there within, has somehow failed to disclose, and teach those skilled in the art how to make and use, that genus minus two of those species, and has thus failed to satisfy the requirements of

[*298] § 112, first paragraph, appears to result from a hypertechnical application of legalistic prose relating to that provision of the statute. All that happened here is that appellants narrowed their claims to avoid having them read on a lost interference count.

Johnson, 558 F.2d at 1019.

There are several reasons *Johnson* does not support Mobil's position. First, in *Johnson* both the unarrowed genus and the excised portion were fully described in the earlier application, and the excised portion included two species embraced by the broad claims. *See id.* at 1011-13, 1018-19; *see also id.* at 1018 (distinguishing *In re Welstead*, 463 F.2d 1110, 59 C.C.P.A. 1105 (1972) where "applicant was attempting to introduce into his claims a new subgenus when '... the specification

[*67] . . . contained neither a description. . . of the [subgenus] . . . nor descriptions of the species thereof amounting in the aggregate to the same thing" (emphasis added)). As discussed, *supra*, the genus here embraces at least hundreds of billions of compounds and Claim 1 embraces about 42,000 compounds.

Second, to the extent "fragmentation" of Markush groups was "required" by the Patent Office in the prosecution of the '635 and '830 patents,⁶¹ it was under § 121. (D.I. 319 at 86; *see also* Tr. at 2213-14.) For example, in connection with prosecution of the '635 patent the examiner rejected the generic claims (e.g. Claim 1 which essentially corresponded to the 1971 summary of the invention) "as being drawn to more than one invention with respect to the compounds embraced thereby, some of which are too. . . [unlike] to be associated together in a claim." (*See* JX 2522 at 30-31; Tr. at 2213-14.) But whatever the Patent Office practice may have been at that time with respect to so-called "Markush claims," the subject matter of claims filed to overcome a § 121 rejection must have been disclosed in the manner provided by the first paragraph of § 112 in order to [*68] be entitled to the original filing date. *See* 35 U.S.C. § 121 (note 59, *supra*). An applicant could not divide undescribed subject matter from an application

and still retain the original filing date. Therefore, the facts relating to § 121 rejections during the prosecution of patents which led to the '437 patent weigh against Mobil's position rather than in its favor.

61 It is noteworthy that the Patent Office did not direct Mobil to "fragment" claims so as to submit the claims at issue. (*See* JX 2522 at 30-31; Tr. at 2212-14; and JX 2524 at 29-32.)

Mobil next argues, in essence, that the Patent Office upheld the validity of its claims, including Claim 1 of the '437 patent, despite the interjection by Rohm and Haas that claims were not adequately supported. (*See* D.I. 319 at 88.) Mobil adds that its patents were subjected to extensive reissue proceedings which were protested by Rohm and Haas. (*Id.* at 5.)

It is fundamental, as discussed *supra*, that issued patents are presumed valid, and a challenger in this Court must prove invalidity by clear and convincing evidence. Moreover, an examiner's decision allowing a patent or on reissue is evidence the Court [*69] must consider. *See Fromson v. Advance Offset Plate, Inc.*, 755 F.2d 1549, 1555, 225 U.S.P.Q. (BNA) 26 (Fed. Cir. 1985). But while the statutory presumption arises at least in part because the Patent Office has certain expertise and is presumed to have done its job in the first instance, *see American Hoist & Derrick Co.*, 725 F.2d at 1359, [HN6] this Court is not bound by Patent Office determinations where a challenger has carried its statutory burden proving invalidity in view of all of the evidence. *See Panduit Corp. v. Dennison Mfg. Co.*, 774 F.2d 1082, 1096, 227 U.S.P.Q. (BNA) 337 (Fed. Cir. 1985), *vacated on other grounds*, 475 U.S. 809, 89 L. Ed. 2d 817, 106 S. Ct. 1578 (1986); *Fromson*, 755 F.2d at 1555; *American Hoist & Derrick Co.*, 725 F.2d at 1359-60. *Cf. Ethicon*, 849 F.2d at 1427-29; *E.I. DuPont de Nemours & Co. v. Phillips Petroleum Co.*, 656 F. Supp. 1343, 1352-53 (D.Del. 1987), *aff'd in part rev'd in part on other grounds*, 849 F.2d 1430 (Fed. Cir. 1988), *cert. denied*, 488 U.S. 986, 109 S. Ct. 542, 102 L. Ed. 2d 572 (1988).

This Court heard the testimony of various distinguished experts called by both

[*299] sides on whether the 1971 application described the claimed subject matter, and considered their testimony together with the facts gathered by the parties over the [**70] past ten years and ably presented at trial. The Court also reviewed and considered the prosecution histories of the Mobil patents, including the '437 patent and the examiner's dispositions of Rohm and Haas' challenges to the support for Claim 1. (JX 2527 at 450-52.) See also *Rohm and Haas Co. v. Mobil Oil Corp.*, 525 F. Supp. 1298, 1303-06 (D.Del. 1981). Cf. *Lear, Inc. v. Adkins*, 395 U.S. 653, 670, 23 L. Ed. 2d 610, 89 S. Ct. 1902 (1969). However, the Court is not persuaded that in view of all of the evidence Rohm and Haas has not shown here by the requisite quantum of evidence that the subject matter of Claim 1 lacks an adequate description in the 1971 application.

Finally, Mobil argues, in effect, that Rohm and Haas prosecuted its patents in the same way Mobil did. (D.I. 319 at 97-101.) This argument is, of course, wholly without force with respect to the Mobil claims in suit.

For the foregoing reasons, the Court finds that Rohm and Haas has shown that the 1971 application provides an inadequate description of the subject matter of Claim 1 under § 112, and therefore is not entitled to the February 1971 filing date under § 120.

ii. Invalidity of the '437 Claim In View of the Rohm and Haas Netherlands Application [**71]

Since Claim 1 is relegated to an effective filing date of September 30, 1975, Rohm and Haas argues that it is invalid as anticipated under § 102 by Rohm and Haas' Netherlands patent application published September 18, 1973. (D.I. 317 at 66-67.)

"Anticipation" requires that each and every limitation of Claim 1 be disclosed in the reference relied on, here the Rohm and Haas Netherlands application. *Corning Glass Works v. Sumitomo Electric U.S.A., Inc.*, 868 F.2d 1251, 1255-56, 9 U.S.P.Q.2D (BNA) 1962 (Fed.Cir. 1989); *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 U.S.P.Q.2D (BNA) 1913 (Fed.Cir. 1989); *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1570, 7 U.S.P.Q.2D (BNA) 1057 (Fed.Cir.

1988); *Akzo N.V. v. ITC*, 808 F.2d 1471, 1479, 1 U.S.P.Q.2D (BNA) 1241 (Fed.Cir. 1986), cert. denied, 482 U.S. 909, 107 S. Ct. 2490, 96 L. Ed. 2d 382 (1989); *Kalman v. Kimberly-Clark, Corp.*, 713 F.2d 760, 771, 218 U.S.P.Q. (BNA) 781 (Fed.Cir. 1983), cert. denied, 465 U.S. 1026, 79 L. Ed. 2d 687, 104 S. Ct. 1284, 224 U.S.P.Q. (BNA) 520 (1984). Every limitation of Claim 1 is met by the Rohm and Haas Netherlands application, because it described and provided herbicidal data for acifluorfen and its methyl ester. (See RX 2099; Tr. at 2042.) See also *In re Gosteli*, 872 F.2d at 1010; *In re Lukach*, 442 F.2d at 970; *In re Slayter*, 47 C.C.P.A. 849, 276 F.2d 408, 411, 125 U.S.P.Q. (BNA) 345 (1960) ("a generic claim [**72] cannot be allowed if the prior art discloses a species falling within the claimed genus"). Therefore, the "invention" of Claim 1 was "described in a printed publication . . . more than one year prior to the date of the application [for the '437 patent]." Claim 1 is, thus, invalid as anticipated under § 102.

c. The Re '215 Patent Claims

Claims 4, 5, and 6 of Re '215 are asserted against Rohm and Haas. (D.I. 283, Tab 3A, para. 4.3.) Application for the '409 patent, reissued as Re '215, was, in fact, filed May 5, 1978, and the continuation reissue application that led to Re '215 was filed February 23, 1983. See Section III *supra*.

Claim 4 is:

Herbicidal compounds having the formula:

[SEE STRUCTURAL FORMULA IN ORIGINAL]

where (X)[n] is a combination of the members selected from the group consisting of halogen, trifluoromethyl, COOH,

[SEE STRUCTURAL FORMULA IN ORIGINAL]

(alkyl of 1 to 4 carbon atoms), hydroxy, alkoxy of 1 to 4 carbon atoms,

[*300] [SEE STRUCTURAL FORMULA IN ORIGINAL]

SH, SR[1], SOR[1], SO[2]R[1], SO[2]NH[2], R[1] and R[2] are selected from the group consisting of alkyl of 1 to 4 carbon atoms, R is hydroxy, and n is an integer of 2 to 5.

(RX 2508, Tab 8, col. 10.) Claims 5 and 6 are dependent [*73] on Claim 4. Claim 5 is a "method for controlling plant growth that comprises applying an herbicidal amount of a compound defined in Claim 4;" and Claim 6 is "an herbicidal composition comprising a carrier for an herbicide and an herbicidal amount of a compound defined in claim 4." (*Id.*)

Claim 4 also carves a subgenus from the class of compounds described by summary of the invention in the 1971 application. The definition of "R" in Claim 4 is limited to the acid form of the claimed compounds. "R is hydroxy." (RX 2508, Tab 8, col. 10.) The 1971 application defined "X" as a "member" selected from a "group" of 16 enumerated "members" including hydrogen. Claim 4 defines (X)[n] as "a combination of the members" selected from a "group" corresponding to that in the 1971 application, except the "members" "NO[2]," "CN," and "alkyl of 1 to 4 carbon atoms" were deleted from Claim 4.⁶² These "members" were deleted from Claim 4 during its prosecution to avoid certain prior art. (*See* JX 2535, vol. I, at 218.) Like Claim 1 of the '437 patent "n" is 2 to 5 in Claim 4. Finally, *no* example in the 1971 application is embraced by Claim 4. (Tr. at 1768, 1774.)

62 Hydrogen was also not among the "X" "members" in Claim 4, although it was in the 1971 summary.

[**74] *i. Description of the Re '215 Claims in the 1971 Application*

The standard for compliance with the description requirement of § 112 was set forth by the Court, *supra*. The inquiry here is whether the 1971 application

reasonably conveyed to the artisan that Dr. Theissen had possession of the claimed subject matter. Since all three claims involve the compounds of Claim 4, the Court will address the description of the subject matter of Claim 4.

As with Claim 1 of the '437 patent, the Court concludes that Rohm and Haas has shown by clear and convincing evidence that the subject matter of Claim 4 was not adequately described in the 1971 application. While the Court is not convinced that the narrower "R" definition in Claim 4 renders the description inadequate (*see e.g.*, JX 2522 at A3983 ["acids . . . thereof"], A3985 ["and a 5-halo (e.g., F, Cl, Br)-2 nitro benzoic acid"]), the limitations of Claim 4 with respect to substitution of the right hand ring were not disclosed in the 1971 application in the manner provided by § 112.

As discussed, *supra*, the 1971 application disclosed to the artisan that the right hand ring could have one to five substituents selected from a group [*75] of 16 enumerated "X" "members," which included hydrogen; and the right hand ring had to have at least one substituent other than hydrogen. The substituents could be from the same "X" "member" or combined with substituents from any other "X" "member." There were no other limitations with respect to substitution of the right hand ring.

Claim 4 limits substitution of the right hand ring in several ways. It diminishes the group of "X" "members," and requires a combination of at least two nonhydrogen substituents. Either limitation would, itself, render the subject matter of Claim 4 subgeneric with respect to the broad class of compounds disclosed in the 1971 application. The coincidence of the limitations metes out an even narrower subgenus of compounds, wherein a combination of at least two right hand ring substituents is required from the diminished group. This narrower class was not described to the artisan by the 1971 application. (*See* Tr. at 1754-55, 1783-84, 2042-45, 2056. *See also* Section IV.A.1.b.i. *supra*.)

[*301] There were no compounds named in the 1971 application that are embraced by Claim 4, which embraces 2.3 billion compounds. (D.I. 286 at 5.)⁶³ Furthermore, [**76] only five of the nonlimiting examples have right hand ring substitutions permitted by Claim 4. (JX 2522 at A 3985-A 3987.)⁶⁴ Only six of the twelve "X" "members" permitted by Claim 4 were represented in these five compounds. Even as diminished, the group of "X" "members" in Claim 4 includes 85 substituents that may be combined at the five available positions on the right hand ring. (See D.I. 286 at 5.)

63 The parties have stipulated that with respect to the chemical structure found in Claim 4 of the Re '215 patent, if "X" represents 85 possible substituents and "R" represents 1 possible substituent, the total number of compounds mathematically embraced by Claim 4 is approximately 2.3 billion. (D.I. 286 at 5.)

64 Methyl-2'-nitro-5'(3-carbomethoxy-4-hydroxyphenoxy) benzoate; methyl-2'-nitro-5'(4-chloro-2-trifluoromethylphenoxy) benzoate (the reverse isomer); methyl-2'-nitro-5'(2-dimethylamino-4-trifluoromethylphenoxy) benzoate; ethyl-2'-nitro-5'(2-amino-4-trifluoromethylphenoxy) benzoate; and ethyl-2'-nitro-5'(2-chloro-4-methyl-sulfinylphenoxy) benzoate.

As discussed more fully, *supra*, each compound is chemically distinct, with different chemical and physical properties. [**77] See Section IV.A.1.b.i. *supra*. It follows that each combination of right hand ring substituents is chemically distinct. Moreover, the herbicidal activity of a compound with a particular combination is unpredictable although no data were provided for any of the five compounds. *Id.* Thus, the five compounds with permitted right hand ring substitutions did not direct the artisan to the subject matter of Claim 4. (See Tr. at 1780-81.) The 1971 application provided no direction for the artisan to just combine and recombine substituents to arrive at the claimed combinations. See *supra*. Therefore, the Court concludes that the artisan would not have understood that Dr. Theissen possessed the subject matter of Claim 4 given the broad class of compounds, the examples, and the claims.

Mobil's arguments for a description of the subject matter of Claim 4 are about the same as those it made in connection with the '437 patent. The Court is likewise unpersuaded.⁶⁵

65 Mobil's arguments that no preferences, working examples or named compounds were needed, and that the Rohm and Haas patents were prosecuted in the same way were already fully addressed, *supra*.

Mobil argues [**78] that the Patent Office found that the written description requirement was satisfied with respect to the Re '215 claims. (D.I. 319 at 88.) The Court has reviewed the Re '215 prosecution history, and has considered the examiner's disposition of the written description issue. (JX 2533 at 216-18.) Taken together with all of the other evidence presented at trial on this issue the Court concludes that there is clear and convincing evidence that the Re '215 claims lack an adequate written description in the 1971 application.

As with the '437 patent *Driscoll* is inapposite. There was nothing in the 1971 application like the statement relied on in *Driscoll* directing the artisan to the subject matter of Claim 4. Furthermore, the focus of the 1971 application was on the left hand ring, not on the combinations of substituents on the right hand ring carved out in Claim 4.

Mobil also argues that *Johnson* supports the adequacy of the description of the subject matter of Claim 4, because the "X" "members" were deleted from Claim 4 to avoid prior art. (D.I. 319 at 92.) However, *Johnson* does not support an adequate description of Claim 4. While "CN," "NO[2]," and "alkyl of 1 to 4 carbon [**79] atoms" were indeed deleted from the group of "X" "members" to overcome prior art, the similarity ends there. Unlike the later claims in *Johnson*, Claim 4 does not merely excise prior art from otherwise fully described subject matter, and the excised portion was not "fully" described. *Johnson* turned on the extent of the original description of both the genus and a later excised portion of it, which amounted "in the aggregate to the same thing" as describing the claimed subgenus. Here, the new subgenus requires a combination of at least two substituents from the narrowed group. Therefore,

[*302] in addition to excising combinations which read on the prior art, the Re '215 claims excise all substitutions which are not combinations of at least two non-hydrogen substituents in the first place. Unlike *Johnson*, the present claim excises prior art from a subgenus of the original genus.

For the foregoing reasons, the Court concludes that Rohm and Haas has shown by clear and convincing evidence that the 1971 application provided an inadequate description under § 112 of the subject matter of Claim 4, and *a fortiori* Claims 5 and 6. Therefore, the claims are not entitled to the February [*80] 1971 filing date under § 120.

ii. Invalidity of the Re '215 Claims In View of the Rohm and Haas Netherlands Application

Since Claims 4, 5, and 6 are relegated to their own filing date, Rohm and Haas argues that they also are anticipated by the Rohm and Haas Netherlands application because the Netherlands application disclosed and provided herbicidal data for acifluorfen. (D.I. 317 at 66-67.)

In accordance with its discussion of the law in Section IV.A.1.b.i. *supra*, the Court finds that every limitation of Claim 4 is met by the Rohm and Haas Netherlands application which described and provided herbicidal data for acifluorfen. (See RX 2099; Tr. at 2042.) See also *In re Gosteli*, 872 F.2d at 1010; *In re Lukach*, 442 F.2d at 970; *In re Slayter*, 276 F.2d at 411. Claim 4 is, thus, invalid as anticipated under § 102.

Claim 5 is a method claim, and is directed to "controlling plant growth" with "an herbicidal amount" of the Claim 4 compounds. Claim 5 is also met by the Rohm and Haas Netherlands application. As discussed above, the compounds of Claim 4 are met by the disclosure of acifluorfen. The Rohm and Haas Netherlands application also provided that the compounds disclosed [*81] therein "displayed an unexpected activity as weed control agents" (RX 2099.1 at 4) and "can be applied in any amount resulting in the desired weed control" (*id.* at 7). Therefore, Claim 5 is also invalid as anticipated under §

102 by the Rohm and Haas Netherlands application.

Claim 6 is directed to compositions comprising the compounds of Claim 4 and a carrier. Claim 6 is also fully met by the Rohm and Haas Netherlands application. The Rohm and Haas Netherlands application disclosed that the compounds disclosed therein could "be applied to the growth medium of the plants . . . as a component of a herbicide composition also comprising a [] . . . carrier." (RX 2099.1 at 7.) Therefore, Claim 6 is invalid as anticipated under § 102 by the Rohm and Haas Netherlands application.

d. The Re '216 Claims

Claims 4, 5, and 6 of the Re '215 patent are asserted against Rohm and Haas. (D.I. 283, Tab 3A, para. 4.4.) Application for the '408 patent, reissued as Re '216, was, in fact, filed September 26, 1977, and the continuation reissue application that led to Re '216 was filed February 23, 1983. See Section III *supra*.

Claims 4, 5, and 6 of the Re '216 patent are identical to the corresponding [*82] claims of Re '215 except that Claim 4 of Re '216 is directed to the salt form of the claimed compounds, whereas Claim 4 of Re '215 is directed to the acids. (See Tr. at 1768, 1774.) That is, in Claim 4 of Re '216 "R is OM in which M is an alkali metal (lithium, sodium and potassium), alkylammonium of 1 to 4 carbon atoms or alkanolammonium of 1 to 4 carbon atoms," whereas in Re '215 "R is hydroxy."

i. Description of the Re '216 Claims in the 1971 Application

As with Claims 4, 5 and 6 of Re '215, the Court is unconvinced that the narrower definition of "R" in Claims 4, 5, and 6 of Re '216 renders the description in the 1971 application inadequate. (See JX 2522 at A3983 ["salts . . . thereof"], A3985 ["and a 5-halo (e.g., F, Cl, Br)-2 nitro benzoic acid . . . or salt thereof"]; Tr. at 1768, 1774.) However, the limitations of the Re '215 and Re '216 claims at issue are identical with respect to substitution of the right hand ring. Therefore, in accordance with its discussion

[*303] of the description of the Re '215 claims in the 1971 application, see Section IV.A.1.c.i. *supra*, the Court finds, likewise, that Rohm and Haas has shown by clear and convincing evidence that the subject [*83] matter of Claims 4, 5, and 6 of Re '216 was not adequately described in the 1971 application. Thus, the claims are not entitled to the 1971 filing date.

ii. Invalidity of the Re '216 Claims In View of the Rohm and Haas Netherlands Application

Rohm and Haas contends that while the Re '216 claims are not anticipated by the Rohm and Haas Netherlands application because the Netherlands application did not disclose salts, they are nonetheless obvious under 35 U.S.C. § 103 ("§ 103")⁶⁶ "since one skilled in the art would expect . . . the corresponding salt of . . . [a herbicidally active diphenyl ether] acid and ester to also have herbicidal activity." (D.I. 317 at 67.)

⁶⁶ [HN7] 35 U.S.C. § 103 provides in part that:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Patentability shall not be negated by the manner in which the invention was made.

35 U.S.C. § 103.

[*84] Though not anticipated under § 102 claims may nonetheless be invalid under § 103 "if the differences between the subject matter . . . [claimed] and the prior art are such that the subject matter as a whole would have been obvious [to the artisan] at the time the invention was made." 35 U.S.C. § 103 (note 66 *supra*). [HN8] Whether a claimed invention is obvious under § 103 requires determination of the scope and content of the prior art, the differences between the prior art and the claims at issue, the level of ordinary skill in the pertinent

art, and any secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17, 15 L. Ed. 2d 545, 86 S. Ct. 684 (1966). See also *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 291, 227 U.S.P.Q. (BNA) 657 (Fed.Cir. 1985), cert. denied, 475 U.S. 1017, 89 L. Ed. 2d 315, 106 S. Ct. 1201 (1986).

Rohm and Haas relies on the Rohm and Haas Netherlands application as prior art for this argument. (D.I. 317 at 67.)⁶⁷ Since Re '216 is not entitled to the 1971 filing date, the Rohm and Haas Netherlands application is prior art.

⁶⁷ Rohm and Haas makes a separate argument that all of the claims asserted here by Mobil are invalid under § 103, relying on 11 different references as prior art. (See D.I. 317 at 75-92.)

[*85] The level of ordinary skill in the art is the subject of a stipulation by the parties. (D.I. 283, Tab 3A, paras. 8.3-8.4; note 33 *supra*.) In accordance therewith, the artisan would have a combination of at least a Bachelor's degree in chemistry and several years' experience in the field of making and testing compounds for use in herbicides.

The difference between the prior art and the Re '216 claims is that the prior art disclosed the acifluorfen acid and methyl ester but not the salt, and the Re '216 claims are directed to salts of the compounds. The question, therefore, is whether in view of all of the evidence there is clear and convincing evidence that given the disclosure of the herbicidal activity of acifluorfen and its methyl ester in the Rohm and Haas Netherlands application it would have been obvious to the artisan that the compounds claimed in Re '216, i.e. the salts, as a whole would be herbicidally active. Only "a reasonable expectation" of the herbicidal activity of the compounds "not absolute predictability" is necessary to show obviousness. See *In re O'Farrell*, 853 F.2d 894, 903-04, 7 U.S.P.Q.2D (BNA) 1673 (Fed. Cir. 1988); *In re Merck & Co.*, 800 F.2d 1091, 1097, 231 U.S.P.Q. (BNA) 375 (Fed. Cir. 1986); [*86] *In re Longi*, 759 F.2d 887, 897, 225 U.S.P.Q. (BNA) 645 (Fed. Cir. 1985); *In re Lamberti*, 545 F.2d 747, 750, 192 U.S.P.Q. (BNA) 278 (C.C.P.A. 1976); *In re Clinton*, 527 F.2d 1226, 1228, 188 U.S.P.Q. (BNA) 365 (C.C.P.A. 1976); see also *Merck & Co. v. Danbury Pharmacal, Inc.*, 873 F.2d 1418, 1419, 10 U.S.P.Q.2D (BNA) 1682 (Fed. Cir. 1989).

[*304] The Court finds that upon considering all of the evidence ⁶⁸ there is clear and convincing evidence that in 1971 the artisan would have had "a reasonable expectation" that the salt form would have herbicidal activity given the activity of the acid and ester. The testimony of the experts called by both Rohm and Haas and Mobil was that as of 1971 it was generally expected that if you had a herbicidally active acid or ester, that its corresponding salts would also be herbicidally active. (Tr. at 2165-67; 2617-19; *see also* Tr. at 3264-65.) In addition, Dr. George Levitt, an expert called by Rohm and Haas, ⁶⁹ pointed out several of what he termed "many" illustrations in the "Herbicide Handbook of the Weed Science Society of America" (RX 2244) ⁷⁰ of well known commercially available herbicides and active formulations containing the acid, ester and salt forms of the active ingredient. (Tr. at 2165A-2168.) Dr. Levitt pointed out that [*87] while the acid, ester or salt form may be more suitable for a particular application, you will "get roughly the same kind of results" with either form. (Tr. at 2166-67.)

⁶⁸ Mobil offers no evidence of nonobviousness to rebut the evidence of obviousness of the salts.

⁶⁹ Dr. Levitt, at the time of trial, was a retired chemist. He was employed by E.I. duPont de Nemours & Company since earning his Ph.D. in 1957 from Michigan State University. (MX 1464.) Dr. Levitt started in agricultural chemical synthesis in 1956 with DuPont before earning his Ph.D. (Tr. at 1914.) While his work included various aspects of research and development, the great majority of his experience was in synthesis and evaluation of the biological activity of agricultural chemicals. (MX 1464; Tr. at 1915-16.) Following his retirement in August of 1986, the DuPont Company built a new laboratory at its Stein-Haskell Research Center and named it "The George Levitt Building for Chemical Discovery." (MX 1464; Tr. at 1918.) Moreover, this year Dr. Levitt was presented with an award from the American Chemical Society for "creative invention" for his invention of the sulfonylurea herbicide. (MX 1464; Tr. at 1919.)

[**88]

⁷⁰ "The Weed Science Society of America" is a well recognized organization within the weed science field. The handbook introduced at trial

(RX 2244) is the Fourth edition with a 1979 publication date.

It is not disputed, as discussed *supra*, that the Rohm and Haas Netherlands application disclosed the acid and methyl ester of acifluorfen, and data showing their herbicidal activities. (*See* RX 2099; RX 2099.1.) The Netherlands application also taught formulation and application of the compounds in compositions. (*Id.* at 8.) Thus, taking the Rohm and Haas Netherlands application as a whole, considering everything it taught, *see EWP Corp. v. Reliance Universal, Inc.*, 755 F.2d 898, 907, 225 U.S.P.Q. (BNA) 20 (Fed. Cir. 1985), the Court concludes that the salt form would have been obvious to the artisan.

In accordance with the foregoing, the Court finds that Claims 4, 5, and 6 of the Re '216 patent are invalid under § 103 as obvious over the Rohm and Haas Netherlands application.

e. The '622 Claims

Claims 1, 3, 5-9 and 11-15 of the '622 patent are asserted against Rohm and Haas. (D.I. 283, Tab 3A, para. 4.5.) The application for the '622 patent was in, filed March 9, 1984. *See* Section [*89] III *supra*.

The '622 claims are of varying breadth, and are directed to "herbicidal compositions" including herbicidal compounds and "methods" for controlling plant growth with the compositions. Furthermore, Claims 3, 5-7, and 11-15 are dependent claims, and stem from either of two independent claims, Claim 8 (a method claim) or Claim 1 (a composition claim).

i. Description of the '622 Claims in the 1971 Application

Claim 8 is:

A method for controlling plant growth which comprises applying a composition consisting essentially of: an herbicidal amount of a compound having the formula:

[SEE STRUCTURAL FORMULA IN ORIGINAL]

[*305] wherein (X)[n] is a combination of the members selected from the group consisting of halogen, trifluoromethyl, COOH,

[SEE STRUCTURAL FORMULA IN ORIGINAL]

(alkyl having 1 to 4 carbon atoms), hydroxy, alkoxy having 1 to 4 carbon atoms,

[SEE STRUCTURAL FORMULA IN ORIGINAL]

SH, SR[1], SOR[1], SO[2]R[1], SO[2]NH[2]; R[1] and R[2] are selected from the group consisting of alkyl having 1 to 4 carbon atoms, R is selected from the group consisting of hydroxy, alkoxy having 1 to 5 carbon atoms, and OM wherein M is an alkali metal of lithium, sodium or potassium, alkylammonium having [*90] 1 to 4 carbon atoms or alkanolammonium having 1 to 4 carbon atoms and *n* is the integer 2; and an agronomically acceptable carrier selected from the group consisting of solid carriers, water and organic carriers.

(RX 2508, Tab 11, col. 10.)

The method of Claim 8 also includes a subgenus of the broad class of compounds disclosed in the 1971 summary of the invention. The definition of "R" is narrower in that the "group" from which "R" is selected consists of five of the ten "members" disclosed in the 1971 application. "R," in Claim 8, is limited to "hydroxy, alkoxy having 1 to 5 carbon atoms, and OM wherein M is an alkali metal . . . [etc.]." That is, "R" covers acid, ester and salt forms of the compounds. The definition of (X)[n] is identical to that in Claim 4 of both the Re '215 and Re '216 patents. That is, the "members" "NO[2]," "CN" and "alkyl of 1 to 4 carbon atoms" are deleted from the "group" as disclosed in the 1971 summary. But in Claim

8, "*n*" equals exactly "2." Finally, no working example or compound claimed in the 1971 application is embraced by the subgenus of compounds in Claim 8, and five of the 57 nonlimiting examples are embraced.

The Court is not convinced that [*91] the narrowed definition of "R" in Claim 8 renders the description contained in the 1971 application inadequate. (See JX 2522 at A3983 ("acids and esters . . . salts . . . thereof"), A3985 ("and a 5-halo (e.g., F, Cl, Br)-2 nitrobenzoic acid or an ester, . . . or salt thereof").) However, Rohm and Haas has shown by clear and convincing evidence that the limitations with respect to substitution of the right hand ring carve out a subgenus of subject matter which was inadequately described in the 1971 application.

With respect to the right hand ring, the subgenus of Claim 8 is even narrower than that in Claim 4 of the Re '215 and Re '216 patents, because the number of substituents must be exactly two.⁷¹ Thus, Claim 8 includes the same limitations with respect to requiring a combination of at least two substituents from the narrowed group of members as Claim 4 of Re '215 and Re '216. In addition, Claim 8 requires exactly two right hand ring substituents from the narrowed group of members. The 1971 application did not convey to the artisan the information that Dr. Theissen possessed the narrower class of compounds defined by Claim 8. (See Tr. at 1754-55, 1783-84, 2042-45, 2056, 2647-55. [*92] See also Section IV.A.1.b.i. *supra*.)

⁷¹ Claim 4 of the Re '215 and Re '216 patents is, arguably, narrower than Claim 8 in that it is directed to either the acid or salt form of the compounds and Claim 8 includes the acid, ester, and salt forms.

Five compounds, all nonlimiting examples, are embraced by the subgenus of compounds in Claim 8.⁷² As with Claim 4 of Re '215 and Re '216 the five compounds include right hand ring substituents from only six of the 12 "X" "members" permitted

[*306] by Claim 8. While the number of combinations of permitted right hand ring substituents in Claim 8 is fewer than in the Re '215 and Re '216 patents, the subgenus in Claim 8 nonetheless embraces approximately 1.3 million compounds, including the acid, ester and salt forms of the compounds. (D.I. 286 at 6.)⁷³ As discussed more fully, *supra*, the mere naming of one of these specific compounds or combination of substituents without more provided little if any information or direction with respect to another and, *a fortiori*, a subgenus embracing it. Each compound and combination of substituents is chemically distinct, and their herbicidal activities unpredictable although no data were presented. [*93] There was no direction provided for the artisan to combine and recombine substituents to arrive at the claimed subgenus. See *supra*. Therefore, the Court concludes that the artisan would not have understood that Dr. Theissen possessed the subject matter of Claim 8 given the broad class of compounds, the examples, and the claims.

72 The 5 nonlimiting examples embraced by Claim 8 are the same examples with right hand ring substitutions permitted by Claim 4 of Re '215 and Re '216. (See Section IV.A.1.c.i. *supra*. Note 64 *supra*.) No more compounds disclosed in the 1971 application have right hand ring substitutions permitted by Claim 8.

73 The parties have stipulated that with respect to the chemical structure in Claim 8, if "X" represents 85 possible substituents and "R" represents 48 possible substituents, the number of compounds mathematically embraced is approximately 1.3 million. (D.I. 286 at 6.)

In accordance with the foregoing, the Court concludes that the subject matter of Claim 8 was not adequately described in the 1971 application. Claim 8 is, thus, not entitled to the 1971 filing date.

Claim 11 is "[a] method according to claim 8 which comprises applying [*94] said composition to plant seedlings after their emergence." (RX 2508, Tab 11, col. 10.) Claim 12 is "[a] method according to claim 8 which comprises spraying plants with an herbicidally effective amount of said composition." (*Id.*) Claim 15 is "[a] method according to claim 8 which comprises applying to plants said compound at a rate of about 0.2 to about 10 pounds per acre." (*Id.*) Those claims include the subgenus of compounds in Claim 8, which was not adequately

described in the 1971 application. Therefore, the Court concludes that the subject matter of Claims 11, 12, and 15 was not adequately described in the 1971 application. Claims 11, 12, and 15 are not entitled to the 1971 filing date.

Claim 9 is dependent on Claim 8. It is "[a] method according to claim 8 wherein X is trifluoromethyl." (RX 2508, Tab 11, col. 10.) Thus, Claim 9 requires a combination of trifluoromethyl, an "X" member, and another substituent from the diminished "group" of "X" members." Although narrower yet than Claim 8, the subject matter of Claim 9 was not adequately described in the 1971 application.

Only three of the five nonlimiting examples embraced by Claim 8 are embraced by Claim 9.⁷⁴ Of [*95] the 11 "members" permitted by Claim 9 for combination with trifluoromethyl, only three substituents from 2 "members," "chloro," "amino," and "dimethylamino," were represented. There are approximately 84 different substituents permitted by Claim 9 for combination with trifluoromethyl. Moreover, no data were provided for the embraced compounds. Each of these combinations is distinct and the 1971 application provided no guidance or direction to combine and recombine substituents to arrive at the claimed subject matter. See *supra*. The Court finds the artisan would not have understood that Dr. Theissen possessed the subject matter of Claim 9 given the broad class, the examples, and the claims. Therefore, the Court concludes that the subject matter of Claim 9 was not adequately described in the 1971 application, and Claim 9 is not entitled to the 1971 filing date.

74 Methyl-2'-nitro-5-(4-chloro-2-trifluoromethylphenoxy) benzoate (the reverse isomer); methyl-2'-nitro-5-(2-dimethyl-amino-4-trifluoromethylphenoxy) benzoate; and ethyl-2'-nitro-5-(2-amino-4-trifluoromethylphenoxy) benzoate.

Claim 13 is also dependent on Claim 8. It is "[a] method according to claim 8 wherein an X is [*96] halogen." (RX 2508, Tab 11, col. 10.) As such, Claim 13 requires a combination of halogen and one other substituent from one of the other 12 "X" members enumerated in Claim 8. Again, while narrower than Claim 8, its subject matter was not described in the 1971 application. Only two of the 57 nonlimiting

[*307] examples are embraced by Claim 13.⁷⁵ These disclosed two combinations of right hand ring substituents, chloro and trifluoromethyl (an "X" "member"), and chloro and methylsulfinyl (a substituent embraced by an "X" "member"). As noted, *supra*, chlorine is one of five halogens (D.I. 285 at 9; D.I. 286 at 4), and there are 11 "members" including about 80 substituents permitted for combination with a halogen. Each of these is also distinct and there was no guidance or direction provided for the artisan to combine and recombine substituents to arrive at the claimed combinations. *See supra*.⁷⁶ Therefore, the artisan would not have understood that Dr. Theissen possessed the subgenus of Claim 13 given the description of the broad class of compounds, the examples, and the claims. Claim 13 is not entitled to the 1971 filing date.

75 Methyl-2'-nitro-5'-(4-chloro-2-trifluoromethylphenyl) benzoate (the reverse isomer); and ethyl-2'-nitro-5'-(2-chloro-4-methylsulfinylphenoxy) benzoate.

[**97]

76 Many of the examples and claims to specific compounds in the 1971 application were compounds having halogen substitutions on the right hand ring. Many of these were substituted with only halogen. Dr. Levitt testified that, in his opinion, in changing from all halogen substitution on a known herbicide to a combination of halogen and one of the other substituents, herbicidal activity would be expected. (Tr. at 2040-41.) However, the Court's inquiry here is with respect to the adequacy of the description of the claimed subject matter as viewed by the artisan, not whether subject matter is obvious to the artisan in view of the provided description. *Cf. Martin*, 823 F.2d at 505 (the question is not whether the artisan *might* have been able to arrive at the claimed subject matter, rather it is a question whether the application necessarily discloses the particular subject matter).

Claim 14 is dependent on Claim 13. It is "[a] method according to claim 13 wherein an X is trifluoromethyl." (RX 2508, Tab 11, col. 10.) Thus, Claim 14 involves a class of compounds where the right hand ring is substituted by only one halogen and only one trifluoromethyl substituent. Therefore, Claim [*98] 14 covers a narrower class of compounds than Claim 1 of the '437 patent in that although Claim 1 required a combination of halogen and trifluoromethyl it also

permitted up to 3 more halogen or trifluoromethyl substituents. *See* Section IV.A.1.b.i. *supra*. (*See also* Tr. at 108-09.) No working example or compound claimed in the 1971 application is within this class of compounds, although the reverse isomer is.

But Claim 14 nonetheless embraces 1,920 compounds, including the acid, ester, and salt forms. (D.I. 286 at 6, para. 11.)⁷⁷ As discussed more fully, *supra*, each of these is chemically distinct, as is each different right hand ring substitution. The reverse isomer described only one right hand ring substitution pattern, and only one combination of substituents (as chlorine is embraced by halogen). Even assuming *arguendo* that chlorine described "halogen" generally, ten right hand ring position isomers are embraced, each having distinct physical and chemical properties. (*See* Tr. at 107-08.)

Moreover, the reverse isomer was listed among the nonlimiting examples, and as such no data were provided for it. There was no direction for the artisan to recombine the [*99] substituents of the reverse isomer, or other substituents disclosed to arrive at the claimed subject matter. *See supra*. Therefore, the Court concludes that the 1971 application did not reasonably inform the artisan that Dr. Theissen possessed the subject matter of Claim 14.

77 the parties have stipulated that with respect to the chemical structure found in Claim 14 of the '622 patent, if "X" represents 4 possible substituents and "R" represents 48 possible substituents, the number of compounds mathematically embraced is 1,920. (D.I. 286 at 6, para. 11.)

Claim 1 is the other independent claim in the '622 patent. It is:

An herbicidal composition comprising as an effective herbicide, a herbicidally effective quantity of 2-nitro-5-(substituted-phenoxy) benzoic acid, salts thereof selected from the group consisting of lithium salts, sodium salts, potassium salts, alkylammonium salts of 1 to 4 carbon atoms and alkanolammonium salts of 1 to 4 carbon atoms, alkyl esters thereof of 1 to 5 carbon atoms and the phenyl ester thereof, wherein said phenoxy is substituted only by a combination of

two members selected from the group
consisting

[*308] of halogen, trifluoromethyl, COOH,

[SEE STRUCTURAL FORMULA
[*100] IN ORIGINAL]

(alkyl of 1 to 4 carbon atoms),
hydroxy, alkoxy of 1 to 4 carbon atoms,

[SEE STRUCTURAL FORMULA IN
ORIGINAL]

SH, SR[1], SOR[1], SO[2]R[1],
SO[2]NH[2], wherein R[1] and R[2] are
selected from the group consisting of alkyl
of 1 to 4 carbon atoms, and an
agronomically acceptable carrier selected
from the group consisting of solid carriers,
water and organic solvents.

(RX 2508, Tab 11, col. 9.) These compositions include compounds having the same limitations with respect to substitution of the right hand ring as the compounds in Claim 8. Therefore, in accordance with its reasoning in connection with the subject matter of Claim 8, the Court concludes that the subject matter of Claim 1 was not adequately described in the 1971 application. Claim 1 is not entitled to the benefit of the 1971 filing date.

Claim 3 is "[a] composition according to claim 1 wherein said carrier is water." (*Id.*) The compositions of this claim also include the compounds in Claim 1. Therefore, the Court likewise concludes that the subject matter of Claim 3 was not adequately described in the 1971 application, and is not entitled to the benefit of the 1971 filing date.

Claim 5 is "[a] composition according [*101] to Claim 1 wherein one member of said combination is halogen." (*Id.*) Thus, the compositions of Claim 5 include the subgenus of compounds having the same limitations with respect to the substitutions of the right hand ring as Claim 13. *See supra*. Therefore, in accordance with its reasoning in connection with the subject matter of Claim 13, the Court concludes that the subject matter of Claim 5 was not adequately described in the 1971 application.

Claim 5 is not entitled to the benefit of the 1971 filing date.

Claim 7 is "[a] composition according to claim 1 wherein one member of said combination is trifluoromethyl." (RX 2508, Tab 11, col. 10.) Thus, the compositions of Claim 7 include the subgenus of compounds having the same limitations with respect to the substitution of the right hand ring as Claim 9. *See supra*. Therefore, in accordance with its reasoning in connection with the subject matter of Claim 9, the Court concludes that the subject matter of Claim 7 was not adequately described in the 1971 application. Claim 7 is not entitled to the benefit of the 1971 filing date.

Claim 6 is "[a] composition according to claim 5 where one member of said combination is trifluoromethyl." [*102] (RX 2508, Tab 11, col. 9.) Thus, the compositions of Claim 6 include the subgenus of compounds having the same limitations with respect to the substitution of the right hand ring as Claim 14. *See supra*. Therefore, in accordance with its discussion of the subject matter of Claim 14, the Court concludes that the subject matter of Claim 6 was not adequately described in the 1971 application. Claim 6 is not entitled to the benefit of the 1971 filing date.

Once again Mobil makes the same arguments that there was an adequate description of the claimed subject matter. Mobil argues that the Patent Office considered the written description issue in connection with the '622 claims, and although it found certain "subgeneric claims" were not described it nonetheless found the claims in suit were adequately described. (D.I. 319 at 89.) The Court has also considered the prosecution history of the '622 patent, and more particularly the examiner's disposition of the written description issue. (JX 2541 at 53-60.) Considering this along with all of the evidence presented at trial the Court is persuaded that there is clear and convincing evidence that there was not an adequate description of the [*103] claimed subject matter in the 1971 application.

Mobil also relies on *In re Johnson* and *In re Driscoll* as with the preceding patents.

[*309] For the reasons set forth in connection with the Re '215 (and Re '216) claims, *supra*, the Court concludes that these cases do not require a different result.

In accordance with the foregoing, none of the '622 claims are entitled to the February 11, 1971 filing date.

ii. Invalidity of the '622 Claims In View of the Rohm and Haas Netherlands Application

Since the '622 claims are relegated to their March 9, 1984 filing date, the Rohm and Haas Netherlands application, published September 18, 1973, is an available prior art reference against them. *See* 35 U.S.C. § 102(b). Rohm and Haas argues that each of the '622 claims is invalid as anticipated under § 102 because the Rohm and Haas Netherlands application specifically disclosed and provided herbicidal data for acifluorfen and its methyl ester. (D.I. 317 at 66-67.)

In accordance with the Court's prior discussion of invalidity under § 102, for a claim to be invalid as anticipated by a prior art reference each and every element of the claim must be met by the reference. *See* Section IV.A.1.b.ii. [*104] *supra*. The '622 claims in suit are of 2 general kinds, those directed to "herbicidal compositions" (viz. Claims 1, 3, 5, 6, and 7), and those directed to "methods for controlling plant growth" (viz. Claims 8, 9, 11, 12, 13, 14, and 15). The Court will take up their validity separately.

The compositions of the '622 claims in suit consist of two elements, the compounds (which the Court has already addressed) and "an agronomically acceptable carrier." According to Claim 1, the broadest composition claim, the compound can be any of those covered by the subgenus and the carrier can be a solid, water or organic solvent. (*See* RX 2508, Tab 11, col. 9, *ll.* 47-48.) The other composition claims are narrower with respect to either the subgenus of compounds or the nature of the carrier.

The Court concludes that the composition claims are anticipated by the Rohm and Haas Netherlands application. The subgenus of compounds included in each

of the composition claims embraces acifluorfen and its methyl ester. The Rohm and Haas Netherlands application disclosed and provided herbicidal data for these compounds. *See supra*. With respect to the carrier limitations, the broadest claim (Claim [*105] 1) provides that the carrier can be a solid, water or organic solvent; and a narrower claim (Claim 3) is limited to water. The Rohm and Haas Netherlands application specifically disclosed that the compounds described therein could be applied "as a component of a herbicide composition also comprising an agronomically acceptable carrier" (RX 2099.1 at 7), and that the carrier could be a solid, water or organic solvent (*id.* at 7-8). Therefore, the Court concludes that the composition claims, viz. Claims 1, 3, 5, 6, and 7, are invalid under § 102 as anticipated by the Rohm and Haas Netherlands application.

The methods of the claims in suit consist of "controlling plant growth" by applying the same compositions. Claim 11 is limited by "applying . . . [the compositions] to plant seedlings after their emergence" (RX 2508, Tab 11, col. 10, *ll.* 54-55), Claim 12 is limited by "spraying plants with an herbicidally effective amount of . . . [the compositions]" (*id.* at *ll.* 57-58), and Claim 15 is limited by "applying . . . [the compounds] to plants . . . at a rate of about 0.2 to about 10 pounds per acre" (*id.* at *ll.* 63-65). Claims 9, 13, and 14 are limited only with respect [*106] to the subgenus of compounds included in the compositions.

The Court concludes that the method claims are also anticipated by the Rohm and Haas Netherlands application. As decided, *supra*, the compositions of the claims are met by Rohm and Haas Netherlands application. The plant application limitations are also met. The Rohm and Haas Netherlands application provides that the compounds disclosed therein "are suitable as herbicide which can be applied before the plants emerge and as herbicide after the plants emerge," and that "post-emergence herbicides are applied after the crop has emerged and during its growth." (RX 2099.1 at 6.) The Rohm and Haas

[*310] Netherlands application further provided that the compounds could "be employed as herbicidal sprays" (*id. at 10*), and could be applied "in any amount resulting in the desired weed control . . . preferably . . . about 0.1-13.4 kg/ha . . . [and] even more preferred . . . about 0.23-4.5 kg/ha" (*id. at 7*).⁷⁸ Therefore, the Court concludes that the method claims, viz. 8, 9, 11, 12, 13, 14, and 15, are also invalid under § 102 as anticipated by the Rohm and Haas Netherlands application.

78 1 lb./acre converts to 1.12 kg/ha. (RX 2601, Tab B, Appendix A.) Therefore, the 0.1-13.4 kg/ha range equals about .09-12 lb./acre, and the 0.23-4.5 kg/ha range equals about .21-4.02 lb./acre.

[**107] *f. Summary: The Mobil Claims Are Invalid*

In summary, Rohm and Haas has established by clear and convincing evidence that the 1971 application did not contain a written description of the subject matter of any of the Mobil claims in suit. The 1971 application merely disclosed a broad genus covering at least hundreds of billions of substituted diphenyl ether compounds on one hand, and about 100 compounds illustrating various substitutions on the other.

The evidence was clear and convincing that there was no direction or guidance for the subgenera now claimed. The later claims require certain combinations of substituents on the right hand ring, but the 1971 application provided no direction or guidance for the artisan to combine and recombine the substituents as disclosed in 1971 to arrive at the requirements of the later claims. Not only were there a very large number for choices of right hand ring substituents and combinations presented to the artisan by the 1971 disclosure making it difficult to arrive at the later claimed subject matter, but also, the focus of the 1971 application was on the left hand ring. *Cf. Flynn, 479 F.2d at 1395.*

In view of all of the evidence, the [*108] breadth of the 1971 disclosure and the few illustrations of various substitutions therein and the lack of any other guidance, the Court finds language of the Court of Customs and Patent Appeals (adapted accordingly) particularly appropriate with regard to Mobil's claim that the subject matter now claimed was described in 1971:

It is an old custom in the woods to mark

trails by making blaze marks on the trees. It is no help in finding a trail or in finding one's way through the woods where the trails have disappeared -- or have not yet been made, which is more like the case here -- to be confronted simply by a large number of unmarked trees. . . . [Mobil is] pointing to trees. We are looking for blaze marks which single out particular trees. We see none.

In re Ruschig, 54 C.C.P.A. 1551, 379 F.2d 990, 994-95, 154 U.S.P.Q. (BNA) 118 (1967). Here, there is clear evidence that there were none for the artisan to see. Therefore, none of the Mobil claims are entitled to the 1971 filing date.

Since none of the Mobil claims are entitled to the 1971 filing date, the Rohm and Haas Netherlands application is available as § 102(b) prior art. The Mobil claims directed to the acid or ester forms of the compounds or to composition [*109] or methods involving the compounds are invalid as anticipated under § 102 by Rohm and Haas Netherlands application. The claims directed to the salts are invalid under § 103 as obvious over the Netherlands application.

2. Other Grounds for Invalidity of the Mobil Claims

In view of the foregoing conclusion that all of the Mobil claims in suit are invalid under either § 102 or § 103 over the Rohm and Haas Netherlands application, the Court need not and will not address the aforementioned separate arguments for invalidity of the claims on other grounds made by Rohm and Haas. Therefore, the Court will enter judgment accordingly.

B. The Rohm And Haas Patents

Mobil challenges the validity or enforceability of both Rohm and Haas patents in suit, Re '455 and Re '731, on four grounds. First, Mobil contends that all of the Rohm and Haas claims in suit are "invalid for structural obviousness" over Mobil's '635 patent, and that Rohm and Haas has not overcome the "presumption of obviousness" arising therefrom. (D.I. 316 at 37.)

Second, Mobil contends that the Rohm and Haas claims in suit are unenforceable

[*311] because Rohm and Haas withheld material information from the Patent Office during the [*110] prosecution of a parent application of both Rohm and Haas patents in suit. (D.I. 316 at 47.)

Third, Mobil contends that the Rohm and Haas claims in suit are unenforceable because Rohm and Haas misled the Patent Office during the '416 and '929 reissue proceedings by making false or misleading statements. (D.I. 316 at 66-68.)

Fourth, Mobil contends that the Rohm and Haas claims in suit are unenforceable because Rohm and Haas submitted a false affidavit under 37 C.F.R. § 1.132 to overcome a structural obviousness rejection during the prosecution of a parent application of both Rohm and Haas patents in suit. (D.I. 316 at 75.)

The Court will address these arguments in turn.

1. The Rohm and Haas Claims Are Invalid for Structural Obviousness

Mobil argues that the Rohm and Haas claims in suit are invalid "for structural obviousness" over the Theissen '635 patent. (D.I. 316 at 37.)

As discussed in Section III *supra*, the Rohm and Haas claims in suit are reissue claims. They are narrower than the claims in the '416 and '929 patents from which they reissued. During the '416 and '929 reissue proceedings, the Rohm and Haas claims were rejected as "structurally obvious" over a number of [*111] compounds named in the '635 patent. (JX 1058A at 222-23; JX 1060A at 319-20; *see also* Tr. at 3571-74.) In each case, the examiner considered the "closest" prior art to be the reverse isomer and five compounds having all halogen substitutions on the right hand ring. (*See* MX 1370; MX 1371.) ⁷⁹ In response, Rohm and Haas submitted affidavits under 37 C.F.R. § 1.132, ⁸⁰ containing a comparative showing of the herbicidal activities of certain Rohm and Haas compounds and compounds named in the '635 patent including those which the examiners considered the "closest" prior art as well as several others selected by Rohm and Haas. (JX 1058A at 274-88; JX 1060A at 327F-327T.)

⁷⁹ Save the reverse isomer, the same six compounds were not cited by the examiners for both reissue applications. *Compare* MX 1370 with MX 1371.

80 In its present form 37 C.F.R. § 1.132 provides that:

When any claim of an application or a patent under reexamination is rejected on reference to a domestic patent which substantially shows or describes but does not claim the invention, or on reference to a foreign patent, or to a printed publication, or to facts within the personal knowledge of an employee of the Office, or when rejected upon a mode or capability of operation attributed to a reference, or because the alleged invention is held to be inoperative or lacking in utility, or frivolous or injurious to public health or morals, affidavits or declarations traversing these references or objections may be received.

[*112] In the '929 case the examiner concluded that the showing was sufficient to establish superiority of the salts of acifluorfen over the '635 patent, but not sufficient with respect to the entire scope of the claims because they permitted substitution at the 6-position. (JX 1058B at 662.) The examiner stated that based on the showing of record, a claim eliminating substitution at the 6-position would be allowable. (*Id.*) In the '416 case, the examiner determined that the comparative showings were inadequate to overcome the structural obviousness rejection. (JX 1060C at 759.) The claims of both cases were finally rejected. (JX 1058B at 658-66; JX 1060C at 757-59; *see also* Tr. at 3577-78.)

Following the rejections, Rohm and Haas submitted amendments narrowing the claims. (*See* JX 1058B at 684; JX 1060C at 859.) The examiners found the narrowed claims to be patentable over the '635 patent, and allowed them. (*See* JX 1058B at 970; JX 1060C at 979.)

Mobil repeatedly protested the Patent Office's choice of the closest prior art compounds, and requested that Rohm and Haas also be required to compare its compounds with compounds named in the '635 patent

having a 4-Cl[3] substituent. [**113] (*See, e.g.*, JX 1058A at 251; JX 1058B at 674, 992-93; JX 1060C at 938-53, 989-93.) But Mobil could not convince the Patent Office to require Rohm and Haas to make a

comparative showing with the 4-Cl[3] compounds from the '635 patent. (*See* JX 1058C at 1109-10.)

[*312] There are two Rohm and Haas patents in suit, Re '455 and Re '731. Claims 1, 2, 6 and 7 of Re '455 are asserted here. (D.I. 283, Tab 3A, para. 4.7.) Claim 1 is:

An agronomically-acceptable salt of a compound of the formula

[SEE STRUCTURAL FORMULA IN ORIGINAL]

wherein

X is a halogen atom, and

Y is a hydrogen atom.

(RX 2509, Tab 5, col. 28.) Claim 2 is "[a] herbicidal composition comprising a salt according to claim 1 and an agronomically acceptable carrier." (*Id.*) Claim 6 is "[a] method of controlling weeds which comprises applying to weed seedlings a salt according to claim 1 in an amount sufficient to control the growth of seedlings." (*Id.*) Claim 7 is "the method of claim 6 wherein the salt is applied at rate of about 0.1 to about 12 pounds per acre." (*Id.*)

Claims 8 and 9 of Re '731 are asserted here. (D.I. 283, Tab 3A, para. 4.8.) Claim 8 is:

A compound of the formula

[SEE STRUCTURAL FORMULA IN ORIGINAL]

(RX 2509, Tab [*114] 4, col. 26.) Claim 9 is:

A compound of the formula

[SEE STRUCTURAL FORMULA IN ORIGINAL]

wherein X is a halogen atom and Z is a carboxy group or a carbalkoxy group having up to 4 carbon atoms in the alkoxy moiety.

(*Id.*)

Presently, Mobil contends that the compounds claimed in Re '455 and Re '731 are "prima facie

structurally obvious" over each of the 4-halogen and 4-CF[3] compounds named in the '635 patent. (D.I. 316 at 37.) Furthermore, Mobil argues, while "prima facie structural obviousness" may be rebutted by showing that the claimed compounds possess unexpected properties over the prior art, the comparative showings submitted to the Patent Office by Rohm and Haas were inadequate because no prior art 4-CF[3] compounds were included and the properties shown were not unexpected. (*Id.* at 37-38.)

As discussed in Section IV.A.1.d.ii. *supra*, a patent claim is invalid for obviousness "if the differences between the [claimed] subject matter . . . and the prior art are such that the subject matter as a whole would have been obvious [to the artisan] at the time the invention was made." 35 U.S.C. § 103. The obviousness inquiry, therefore, requires a determination of the scope and content [*115] of the prior art asserted, the level of skill of the artisan, the differences between the prior art and the claimed subject matter, and any secondary considerations such as commercial success, long felt but unresolved needs and the failure of others. *Graham*, 383 U.S. at 17-18; see also *In re O'Farrell*, 853 F.2d at 902; *Asland Oil*, 776 F.2d at 291.

But Mobil contends that "in the case of inventions involving chemical compounds, the concept of 'obviousness' has been refined based on the experience that compounds having certain closely related structures will have similar properties." (D.I. 316 at 24.) If the structure of a claimed compound is "sufficiently close" to the structure of a prior art compound, "there is a presumption" that the claimed compound will have properties "similar to" the prior art compound. (*Id.*) Mobil contends that "a presumption of obviousness" can arise where there is "a small structural difference" between claimed compounds and the prior art, and that such a presumption exists where the claimed and prior art compounds are "homologs," "isomers," or "structurally close analogs" and the prior art affirmatively teaches modification to obtain the [*116] claimed compound. (*Id.*)

Fewer precepts have been made clearer by the Federal Circuit than that a patent is presumed valid and a party asserting its invalidity in this Court bears and

[*313] retains the burden of proving invalidity by clear and convincing evidence. See *Panduit*, 774 F.2d at 1096-97; *Ralston Purina*, 772 F.2d at 1573; *Lear Siegler, Inc. v. Aeroquip Corp.*, 733 F.2d 881, 885, 221 U.S.P.Q. (BNA) 1025 (Fed.Cir. 1984); *Hughes Aircraft Co. v. United States*, 717 F.2d 1351, 1359, 219 U.S.P.Q. (BNA) 473 (Fed.Cir. 1983). See also *supra*. The presumption of validity is never weakened, *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1574-75, 221 U.S.P.Q. (BNA) 929 (Fed.Cir. 1984), and the burden of proving invalidity never shifts from the party asserting invalidity. *American Hoist & Derrick*, 725 F.2d at 1359-60; *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1534 (1983). Rather, [HN9] the burden of going forward with evidence rebutting invalidity shifts to the patentee, but only after the party asserting invalidity has established a legally sufficient *prima facie* case of invalidity. *Ashland Oil*, 776 F.2d at 291-92; see also *Ralston Purina*, 772 F.2d at 1573. The Court then looks at all of the evidence of invalidity together with all of [*117] the evidence rebutting invalidity (if any) and decides whether there is clear and convincing evidence that the patent is invalid. See *id.*; see also *In re Piasecki*, 745 F.2d 1468, 1472-73, 223 U.S.P.Q. (BNA) 785 (Fed.Cir. 1984); *Lear Siegler*, 733 F.2d at 885.

Moreover, [HN10] obviousness is a legal conclusion barring the patentability of a claim applied for, or serving as a basis for the invalidity of an issued claim. See *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1050, 5 U.S.P.Q.2D (BNA) 1434 (Fed.Cir.), *cert. denied*, 488 U.S. 825, 109 S. Ct. 75, 102 L. Ed. 2d 51 (1988). It is a matter of patent law not chemistry. *In re Johnson*, 747 F.2d 1456, 1460, 223 U.S.P.Q. (BNA) 1260 (Fed.Cir.1984). The requirement of unobviousness in the case of chemical inventions is the same as for other types of inventions. *Id.*

Mobil has seized upon the concept of "prima facie structural obviousness" arising from structural similarity between prior art and claimed chemical compounds. For this concept Mobil has relied on cases involving rejections by the Patent Office.⁸¹ Such a rejection based on similarity in chemical structure and function "entails the motivation of . . . [the artisan] to make a claimed compound, in the expectation that compounds similar in structure will have similar [*118] properties." *In re Payne*, 606 F.2d 303, 313, 203 U.S.P.Q. (BNA) 245 (C.C.P.A. 1979).

81 In the *ex parte* proceedings before the Patent Office the concept of "prima facie obviousness" developed as "but a procedural mechanism to allocate in an orderly way the burdens of going forward and of persuasion as between the examiner and the applicant." *In re Piasecki*, 745 F.2d at 1472. See also *In re Johnson*, 747 F.2d at 1460.

There are, however, critical differences between Patent Office rejections (and appeals therefrom) and proof of invalidity in the present proceeding. For one, the Patent Office is possessed with expertise in the art. A conclusion that may be clear from certain facts (such as bare structural similarity between certain compounds) in view of an examiner's expertise may require further evidence in the form of an expert opinion to be as clear in the present context.⁸² Additionally, a mere preponderance of the evidence must show unpatentability before the Patent Office may reject a claim. *Ethicon*, 849 F.2d at 1427. But as discussed above, this Court must be left with clear and convincing evidence of invalidity.

82 This Court as well as the Federal Circuit has recognized the utility and perhaps need for expert testimony as to what would be understood or recognized by "the artisan" in patent cases involving complex scientific principles. See *Rohm and Haas Co. v. Mobil Oil Corp.*, 525 F. Supp. 1298, 1305 (D.Del. 1981); see also *Moeller v. Ionetics, Inc.*, 794 F.2d 653, 657 (Fed. Cir. 1986); *Phillips Petroleum Co. v. United States Steel Corp.*, 673 F. Supp. 1278, 1330 (D.Del. 1987), *aff'd*, 865 F.2d 1247, 9 U.S.P.Q.2D (BNA) 1461 (Fed. Cir. 1989).

[*119] Therefore, the Court concludes that in this proceeding the structural relationship between the prior art and claimed compounds (or a difference between the claimed compounds and the prior art) is a fact that may, when taken together with all of the evidence, bear on the obviousness or unobviousness of the claimed compounds. *Cf. In re Payne*, 606 F.2d at 314. See also *In re Merck*, 800 F.2d at 1096. The Court will view this fact along with all evidence in deciding whether Mobil has shown the Rohm and Haas compounds to be obvious. The Court now turns to the obviousness inquiry.

[*314] The only prior art reference asserted by Mobil as a basis for obviousness is the '635 patent, and more specifically five compounds named therein. (See D.I. 316 at 41-42; D.I. 322 at 21.) The five compounds have the following structures:

[SEE STRUCTURAL FORMULA IN ORIGINAL]

(D.I. 316 at 41.)

The '635 patent taught a very broad class of substituted diphenyl ether herbicides having a 4'-NO[2], 2'-COR, and one or up to five substituents on the right hand ring in any configuration. (RX 2508, Tab 2, col. 1.)⁸³ The substituents were to be selected from an enumerated group of nearly 100 substituents including [**120] halogen and trifluoromethyl. (*Id.*) It also taught nearly 100 specific compounds, among which were the five asserted here by Mobil. (*Id.* at cols. 2-5.)

83 The application for the '635 patent was the 1971 application, which is discussed more fully in Section IV.A.1.a. *supra*.

The '635 patent taught that the compounds disclosed could be made by the "Ullman ether synthesis" reaction between a 5-halo-2 nitro benzoic acid, ester, amide or salt, and an alkali metal salt of a substituted phenol. (See RX 2508, Tab 2, col. 2 and cols. 3-4.) See also Section IV.A.1.a. *supra*. Accordingly, the right hand ring substitution depended on the starting materials. (See Tr. at 1715-18a.)⁸⁴ The patent taught, generally, that the compounds were "effective herbicides when applied in herbicidal amounts . . . between about 0.2 pound and

about 10 pounds per acre." (RX 2508, Tab 2, col. 5, 11, 32-35.) The specific herbicidal data provided for particular compounds, though, ranged from applications at 0.5 pound to 10 pounds per acre. (See *id.* at cols. 5-8 Table.)

84 Dr. Roberts also testified that it was known to the art that diphenyl ether substitutions could be altered after the diphenyl ether was made. (See Tr. at 1715-18a.)

[**121] The structural difference between the five prior art compounds and the compounds of the Re '731 and Re '455 claims in suit is, essentially, substitution of the right hand ring.⁸⁵ All of the Rohm and Haas claims require a CF[3] in the 4-position and a halogen in the 2-position, and permit no other right hand ring substitution. Claim 8 of Re '731 is directed specifically to acifluorfen, that is, 4'-NO[2], 2'-CO[2]H, 2-C1, 4-CF[3] substitution.

85 While there are certain differences in the left hand rings of the Mobil and Rohm and Haas compounds, the compounds of both parties are salts, acids or esters of 4'-NO[2], 3'-carboxy substituted diphenyl ethers. The differences in the left hand rings are not material to the present discussion.

The five prior art compounds also have 2, 4 substituted right hand rings. One compound, the reverse isomer, differs from the Rohm and Haas compounds in that it has a halogen (chlorine) and a trifluoromethyl

[*315] but they occupy the 4- and 2- positions respectively, opposite from the Rohm and Haas compounds. Two compounds differ from the Rohm and Haas compounds in that they have a halogen at both the 2- and 4- positions and no trifluoromethyl. Two others [*122] differ in that they have a trifluoromethyl at the 4-position, but not a halogen at the two position.

The parties have stipulated with respect to the level of skill of the artisan. The artisan would have a combination of at least a Bachelor's degree in chemistry and several years' experience in making and testing herbicidal compounds. (Note 33 *supra*.)

The Court's inquiry, therefore, is whether in view of all of the evidence, there is clear and convincing evidence that the artisan would reasonably have expected the herbicidal activity of the compounds claimed by Rohm and Haas. See *In re O'Farrell*, 853 F.2d at 903-04. See also *Merck*, 873 F.2d at 1419; *In re Merck*, 800 F.2d at 1097; *In re Longi*, 759 F.2d at 897; *In re Lamberti*, 545 F.2d at 750; *In re Clinton*, 527 F.2d at 1228.

For its part, Mobil proffers only the '635 patent as evidence of obviousness. (See D.I. 322 at 23.)⁸⁶ Mobil points to no other evidence or testimony regarding the expectations of the artisan given the '635 patent. It merely posits, *ipse dixit* that "each of the five structurally close compounds . . . renders the . . . [Rohm and Haas] claims *prima facie* obvious," and that it does [*123] not have the burden to prove that any differences in herbicidal activity between these and Rohm and Haas' compounds were "expected." (*Id.*) Rather, Mobil contends that it is Rohm and Haas' burden to show unexpected activity. (*Id.* at 23-24.)

86 Mobil's response to Rohm and Haas' contention that Mobil's case for obviousness is devoid of record support is: "The only way that Mobil's case of *prima facie* obviousness could be 'devoid of record support' is if the '635 . . . patent were not in evidence." (D.I. 322 at 23.)

Although not brought to the attention of the Court by Mobil, the Court nonetheless finds some evidence in the record of obviousness over some of the compounds posited by Mobil. Dr. Levitt testified that if one changed from an all halogen right hand ring of a known herbicide to a combination of halogen and trifluoromethyl, then he would have expected herbicidal activity. (Tr. at 2040-41.)

For its part Rohm and Haas first lends to Mobil's case, conceding that "the reverse isomer renders . . . [the Rohm and Haas compounds] *prima facie* obvious." (D.I. 318 at 28.) The Court accepts this as a concession of fact, that the artisan would, based on the structural [*124] relationship between the reverse isomer and the Rohm and Haas compounds, have been motivated to make the Rohm and Haas compounds in the expectation that they would have herbicidal activity similar to the reverse isomer. See *In re Payne*, 606 F.2d at 313.

As evidence of unobviousness Rohm and Haas proffers the affidavits submitted to overcome the Patent Office's structural obviousness rejections. (D.I. 318 at 26-30.) One is the affidavit of Dr. Roy Yih. (MX 1576 at 73-77.)⁸⁷ The Yih affidavit included a comparative showing of acifluorfen methyl ester and its reverse isomer. The compounds were applied to a variety of weeds at rates of 1/8, 1/4, and 1/2 pound per acre. (*Id.* at 75.) The data were based on the average percent control achieved by the test compounds in terms of degree of injury to plants when compared with untreated controls. (*Id.*) The compounds were rated as applied to each weed on a scale from 0 for no control to 100 for complete kill. (*Id.*)

87 At the time of trial Dr. Yih was research department manager at Rohm and Haas. (Tr. at 3391.) He joined Rohm and Haas in 1962 as senior scientist. (*Id.* at 3392-93.)

Dr. Yih concluded that the comparative [*125] test results showed "highly significant and

[*316] unexpected differences" between the herbicidal activities of the two compounds, and that acifluorfen methyl ester was "significantly and unexpectedly" much more active in general herbicidal activity. (*Id.* at 77.) He further concluded that the acifluorfen compound had significantly greater activity both pre-emergence and post-emergence, and controlled several "exceedingly troublesome weeds." (*Id.*) Yih opined that the acifluorfen compound was an extremely valuable herbicide because of "its extremely high activity at low as well as high rates of application, both pre- and post-emergence," and because it controlled "many troublesome weeds." (*Id.*) at trial, Dr. Yih testified that there was nothing in the published literature at that time that would have led one to expect the differences in activity between the two compounds that were reflected in his affidavit. (Tr. at 3511-12.)

Rohm and Haas also proffers declarations of Vincent Musco submitted to the Patent Office in response to the structural obviousness rejections during the '416 and '929 reissues. (JX 1058A at 274-88; JX 1060A at 327F-327T. See also D.I. 292, para. 1.) ⁸⁸ [*126] In each case the herbicidal activities of claimed compounds were compared against those of compounds from the '635 patent chosen by the examiners, as well as several additional prior art compounds chosen by Rohm and Haas. The Rohm and Haas compounds used in both declarations are also embraced by the respective reissue claims in suit.

⁸⁸ The Musco declarations were stipulated into evidence, and for expedience the parties stipulated that Mr. Musco would not give testimony at trial concerning the declarations. (D.I. 282 at para. 1.) It was also stipulated that the tests described in the declarations were performed in the manner described and the visual observations were accurately reported therein and were obtained in a professional manner in accordance with the described test procedures. (*Id.*)

In the '416 case (eventually Re '731), acifluorfen and

its methyl, ethyl and isopropyl esters were tested against 10 compounds from the '635 patent including acids and esters having all halogen right hand ring substitutions as well as the reverse isomers of acifluorfen, its methyl and ethyl esters. (See JX 1060A at 327G-327H.) In the '929 case (eventually Re '455), the sodium, ethylammonium, [*127] and ethanolanmonium salts of acifluorfen were tested against 12 salts of compounds from the '635 patent having all halogen substituted right hand rings as well as the sodium, ethylammonium, and ethanolanmonium salts of the reverse isomer of acifluorfen. (See JX 1058A at 275-277.)

Like the Yih affidavit, the Musco submissions tested the compounds on a variety of weeds. In the '416 case the compounds were applied pre-emergence at rates of 0.25 and 0.5 pound per acre, and post-emergence at 0.12 and 0.25 pound per acre. (JX 1060A at 327L-327S.) In the '929 case the compounds were applied pre-emergence at rates of 0.5 and 1.0 pound per acre, and post-emergence at 0.25 and 0.5 pound per acre. (JX 1058A at 280-287.) After 14 days injury observations were recorded. (JX 1060A at 327K; JX 1058A at 279.) The same visual rating method and scale for plant injury used by Dr. Yih were used; that is 0 to 100% where 0 indicates no injury and 100 indicates complete kill. (JX 1060A at 327K; JX 1058A at 279.) ⁸⁹ The rating data were presented in tabular form, providing separate ratings for each compound on each plant species ⁹⁰ both pre-emergence and post-emergence.

⁸⁹ Visual rating is the visual evaluation of herbicide activity on a plant treated with a herbicide when compared with one untreated plant. (D.I. 283, Tab 3B, Appendix A at 7.)

[**128]

⁹⁰ No data were reported on an occasional plant species because it did not germinate.

The Court finds as fact that by and large this data is comparable to those in the Yih affidavit, showing about the same superiority

[*317] of the acifluorfen compounds over the prior art compounds. In both the '929 and '416 cases, while a compound from the '635 patent exhibited occasional activity on one or several plant species, the Rohm and Haas compounds clearly and consistently caused significantly more injury to the plants than both the all-halogen and reverse isomer compounds in the '635 patent. Moreover, in the vast majority of instances the '635 compounds exhibited little or no activity at the given rates.

Next, Rohm and Haas proffers the comparative data generated by Mobil's own expert, Dr. Ilnicki. (D.I. 318 at 41.) Dr. Ilnicki tested a number of compounds side-by-side at the direction of Mobil in preparation for trial. (See JX 2457; Tr. at 2762-63.)⁹¹ Among the compounds tested were acifluorfen methyl ester and the 2-CN, 4-CF[3] compound, which is one of the five prior art compounds vigorously posited here by Mobil. (JX 2457 [compound No. 1]; see also D.I. 283, Tab 3A, para. 12.2.) [**129] Dr. Ilnicki testified that based on the data he generated, acifluorfen methyl ester had the highest herbicidal activity both pre- and post-emergence of any of the compounds he tested including the 2-CN, 4-CF[3] compound. (Tr. at 2860-61; 2874-79.)

91 The parties have stipulated that these tests by Dr. Ilnicki were performed in a professional manner in accordance with the described test procedures, and that the visual observations were accurately reported. (D.I. 191, para. 2.)

Finally, Rohm and Haas proffers Mobil's research data and actions after learning of the acifluorfen compounds, and the commercial acceptance of BLAZER and TACKLE. (D.I. 318 at 41-42.) By mid 1970 Mobil had tested compounds from the '635 patent including the two 4-CF[3] compounds it posits here. (RX 2322; RX 2337.) But the only herbicide commercialized by Mobil before TACKLE was MODOWN, an all halogen 2-4 substituted compound. (D.I. 283, Tab 3B, para. 16.18.)

Furthermore, as found *supra*, although Mobil had

made and tested 4-CF [3] compounds within the 1971 application, including the two compounds it asserts here, Mobil's substituted diphenyl ether research program was essentially moribund as of 1974 with respect [**130] to compounds embraced by the 1971 application. Mobil's research produced no promising herbicide candidates except MODOWN. See Section II *supra*. But the "extraordinary" and "outstanding" activity of acifluorfen compounds led Mobil to "reinstate" its program. (RX 2123 at 445.)

Thereafter, from September of 1975 through the beginning of August 1977, 13 compounds within the 1971 application were synthesized and tested at Mobil, and 11 had the 2-Cl, 4-CF[3] acifluorfen substitution. (MX 1609 at 13-14.) Of the other two, one had a 2-Cl, 3-CF[3] substitution and one had a 2,4-dichloro substitution. (*Id.*)

Through the balance of August 1977, seven compounds were made and tested, all having the 2-NO[2], 4-CF[3] substitution of one of the compounds posited here by Mobil. (*Id.* at 14-15.) Then Mobil tried several compounds having the right hand ring substitution of the reverse isomer, that is, 2-CF[3], 4-Cl. (*Id.* at 15.)

After all of this testing of the acifluorfen compounds and the prior art compounds, by early 1978 Mobil concluded that it would try to "establish a position" on acifluorfen salts (RX 2118; RX 2161A; Tr. at 1203), and to "pursue the development" of acifluorfen [**131] methyl ester "or an analog with a firmer proprietary position." (RX 2118; Tr. at 1203.) Mobil also initiated negotiations with Rohm and Haas regarding the patent rights to BLAZER, acifluorfen and its related esters (RX 2338 at 151; Tr. at 1212), and undertook an "extensive" field testing program to try to come up with "an alternative to Mobil obtaining some rights to BLAZER." (RX 2338 at 151; Tr. at 1212-13.)

[*318] During 1978 Mobil completed what it characterized as "its most extensive herbicide field evaluation program since MODOWN with 11 compounds being tested by 32 cooperators in 20 states." (RX 2355 at 401298.) Mobil concluded that "the trifluoromethyl (CF[3]) diphenyl ether herbicides" were "a strong class" of herbicides with pre- and post-emergence activity. (*Id.* at 401295.) Based on the results Mobil selected four compounds for further field evaluation. (*Id.*) The compounds selected were the sodium salt, the methyl and ethyl esters of acifluorfen, and the potassium salt of Mobil's MODOWN, an all halogen right hand ring compound. (*Id.*; RX 2188A; RX 2134A; RX 2135; *see also* D.I. 283, Tab 3B, para. 16.7.)

No agreement was reached between Rohm and Haas and Mobil (D.I. [*132] 283, Tab 3B, para. 16.4.) But, nonetheless, in May of 1979 Mobil announced that it would develop the sodium salt of acifluorfen and its methyl and ethyl esters as commercial candidate herbicides. (RX 2190; Tr. at 1251-52.) Mobil has already commercialized the sodium salt (TACKLE). (Tr. at 1252; *see also* D.I. 283, Tab 3B, para. 16.10.) It did so because of its perceived commercial potential. (*Id.*)

BLAZER and TACKLE control a broad spectrum of broadleaf weeds commonly found in soybeans, and permit improved soybean cultivation practices and solve some soil problems. (D.I. 283, Tab 3B, para. 15.1.) From 1974 to 1978, there was an unsatisfied need for broadleaf weed control in soybeans and a growing market for a soybean herbicide. (*Id.* at P 16.20.) During this period, several commercial soybean herbicides were introduced including SENECOR<tm>, BASAGRAN<tm>, and Mobil's MODOWN<tm> (*Id.*) These herbicides were tested against the acifluorfen compounds in Mobil's "extensive field evaluation program" in 1978 which led to Mobil's conclusion to develop the acifluorfen compounds as commercial herbicides. (*See* RX 2188A at 409021-32; Tr. at 1240-46; *see also* RX 2124; [*133] JX 2134A; Tr. at 1193, 1246-47, 1502.) Moreover, in 1979 six states

sought and obtained emergency exemptions to use BLAZER before full registration was obtained from the EPA. (D.I. 283, Tab 3B, para. 15.6.) Such exemptions are granted at the request of the state "if no other available product adequately controls a particular weed." (*Id.*)

Rohm and Haas also proffers persuasive evidence that the high herbicidal activity of the acifluorfen compounds results from the characteristic 2-Cl, 4-CF[3] substitution on the right hand ring. Rohm and Haas' expert, Dr. Penner, tested two isomers of acifluorfen, a 3-CF[3], 4-Cl compound and a 2-Cl, 5-CF[3] compound. (D.I. 283, Tab 3A, para. 12.1 [compounds a and b].) He testified that these compounds possessed little or no herbicidal activity when tested pre- and post-emergence at 10 pounds per acre against the acifluorfen compounds. (*See* JX 1485 [compounds A and B]; Tr. at 248-50.)

Mobil's own expert, Dr. Ilnicki, also tested acifluorfen methyl ester and its reverse isomer, and testified that his data showed "substantially higher herbicidal activity" for the acifluorfen methyl ester. (Tr. at 2887-88; JX 2457 [compounds 4 and 5]; *see also* [*134] D.I. 283, Tab 3A, para. 12.2 [compounds 4 and 5].) Likewise, Dr. Theissen's research showed the superiority of the acifluorfen methyl ester over the reverse isomer (Tr. at 817), as well as over other compounds having a 2-Cl, 5-CF[3] substitution. (RX 2289; RX 2353; Tr. at 829.) Based on his work, Dr. Theissen wrote that "crucial factors of substituent orientation are markedly seen with . . . CF[3] analogs" of acifluorfen methyl ester (RX 2289 at 758), and that "the 5-CF[3] isomers have only trace herbicidal activity at 4 lb/A." (*Id.*)

The Court concludes that there is not clear and convincing evidence that the Rohm and Haas claims are obvious. The bare assertion that the Rohm and Haas compounds are "prima facie structurally obvious" over '635 patent and the compounds and data disclosed therein did not

[*319] establish obviousness by clear and convincing evidence. To the extent that the concession by Rohm and Haas respecting the reverse isomer and the testimony of Dr. Levitt respecting structural modification of an all halogen herbicide was evidence of obviousness, the evidence in the Yih and Musco affidavits tipped the weight of evidence away from obviousness and, in fact, persuaded [*135] the Court that the Rohm and Haas compounds were unobvious. Unobviousness was further supported by Mobil's own excitement over the acifluorfen compounds, and its conclusion to commercialize them above others tested. Likewise the evidence of commercial success of the sodium salt in BLAZER and TACKLE is further evidence of unobviousness. Viewing *all* of the evidence together, Mobil has not satisfied its burden of showing obviousness by clear and convincing evidence.

Mobil makes several arguments to the Court regarding obviousness and the evidence proffered by Rohm and Haas. Mobil argues that *In re Johnson*, 747 F.2d 1456, 223 U.S.P.Q. (BNA) 1260, holds "that where the prior art discloses two diphenyl ether analogs, each of which differs from a claimed compound at a single, different substituent position, then each analog renders the claims *prima facie* obvious and the applicant must demonstrate superiority over each prior art analog." (D.I. 322 at 18.) Mobil, thus, contends that under *Johnson* each of the compounds it posits from the '635 patent (*viz.* the 4-halogen and 4-CF[3] compounds) renders the Rohm and Haas claims *prima facie* obvious, and Rohm and Haas must establish "unexpected superiority" [*136] over them in rebuttal. (*Id.* at 19.)

Mobil misreads *Johnson*. In *Johnson*, the examiner rejected applicant's claims directed to substituted diphenyl ether compounds as "structurally obvious" over compounds disclosed in two separate prior art references. To overcome the rejection the applicant filed an affidavit comparing the activity of a claimed compound to a compound from one of the cited references. The affidavit showed that the claimed compound had unexpected activity compared to the prior art compound. *Id.* at 1459. But the examiner rejected the claims again as

"structurally obvious" over the other reference originally cited, stating that a showing of unexpected activity of the claimed compounds over this reference would also be required. *Id.*

On appeal to the Board, the applicant argued that the rejection was improper because the two references were "equally close" and as such applicant needed only to make a comparative showing with one of the references. *Id.* The Board agreed with the examiner's conclusion of *prima facie* obviousness, and with respect to the affidavit noted that the question was not which reference was the closest prior art, "the 'references' [*137] together singly . . . [taught] a *different* substituent from . . . [applicant's claimed compound] at one position." *Id.* at 1460 (emphasis in original). Thus, the Board held, the applicant had to test one compound from each reference.

The applicant advanced the same argument appealing the Board's decision to the Federal Circuit, that it needed only to show unexpected activity over either of two "equally close" references to overcome a *prima facie* obviousness rejection, but not both. Since both references differed at one substituent position, the applicant argued that it was free to choose which to compare the activity of the claimed compound with. *Id.* at 1460.

The Federal Circuit affirmed the Patent Office, holding that "[HN11] the fact finder is entitled to his own ideas . . . as to what evidentiary facts will persuade him of unexpected results . . . [and that] whether rebuttal evidence is sufficient to persuade the examiner that unexpected results exist is an evidentiary matter . . . for the trier of fact." *Id.* The Court found that the applicant produced no evidence that the two cited references were the same, and therefore comparison with one reference when the rejection [*138] was based on two was insufficient. *Id.*

Mobil would have the Court read *Johnson* as deciding as a matter of law that any time a claimed compound differs from prior art compounds by one substituent, then, *ipso facto*, the claimed compound

[*320] is obvious over each prior art compound. But *Johnson* did not decide this. *Johnson* merely addressed the propriety of the examiner's rejection which followed the applicant's showing of superiority of his compound over one of two cited references. The Federal Circuit held that it was up to the examiner, within reason, to decide whether the applicant's evidence was sufficient to overcome a particular obviousness rejection. *See id.* at 1460. In fact, the Court stated that in view of this reasoning it did not need to address whether the two references cited by the examiner (each differing from the claimed compounds by one substituent) were "equally close." *Id.* Whether the artisan would expect prior art and claimed compounds to have similar properties based on their structural relationship is a factual matter depending on chemistry and the art at issue. *Johnson* does not fill the void in the record on this point.

Mobil also argues [*139] that the evidence in the Musco submissions does not establish unexpected activity, because only two application rates were shown and therefore the results could show only a twofold superiority of the acifluorfen compounds which cannot as a matter of law be unexpected. (D.I. 316 at 43-47.)

Again Mobil's argument does not suffice for record evidence. The Court considered the data contained in the Musco submissions as evidence of unobviousness. Taking them together with all of the other evidence, the Court concluded that Mobil had not met its burden of showing obviousness by clear and convincing evidence. Mobil attempts to carry its burden of showing that the artisan would have expected the activity shown by *arguing* the Musco data could not show unexpected results. But there are several problems with this argument. First, the Court does not agree that the Musco submissions are not evidence that the artisan would not have expected the results therein. As found above, they clearly show consistent superiority of the acifluorfen compounds. Moreover, the Court does not agree with Mobil that a twofold difference in activity cannot, as a matter of law, be unexpected. What would be unexpected [*140] to the artisan is a matter of fact.⁹²

92 For example, it could hardly be contended that it would not be "unexpected" for a child of two average-sized adults to grow to twice the height of either parent. Likewise, whether the activity of a compound is "expected" depends on what, in fact, the artisan would "expect" given the facts. Again, Mobil attempts to cover a void in its case by claiming that the matter is one of law that has been settled in its favor.

Second, Mobil's own expert, Dr. Ilnicki, testified that the results contained in the Musco submissions were a fair evaluation of the relative herbicidal activity of the compounds tested. (Tr. at 2838-39.) Moreover, the other evidence including the astonishment of Mobil's own scientists and its reinstitution of research based on the herbicidal activity of the acifluorfen compounds over its own compounds in the '635 patent belies its argument that the activity of the acifluorfen compounds was not unexpected.

Therefore, in accordance with the foregoing the Court concludes that Mobil has not shown the Rohm and Haas claims to be invalid as obvious under § 103.

2. The Re '731 and Re '455 Claims Are Unenforceable Because Rohm and [*141] Haas Withheld Material Information From the Patent Office

Mobil next contends that the Re '731 and Re '455 claims are unenforceable because Rohm and Haas withheld material information from the Patent Office during the prosecution of the application leading to the '416 patent, a parent of both Re '731 and Re '455. (D.I. 316 at 48.) The "information" at issue consists of the results of herbicidal activity tests of three compounds named in the '635 patent, a 2-CN 4-CF[3] compound, a 2-NO[2] 4-CF[3] compound, and a 2,4 dichloro compound (the active ingredient in MODOWN). (*Id.* at 51-52.) Mobil contends that Rohm and Haas submitted the Yih affidavit, *supra*, to the Patent Office but did not disclose that the other three compounds had been tested and were found to have herbicidal activity. Instead,

[*321] Mobil contends, Rohm and Haas ran a new test comparing acifluorfen methyl ester with its reverse isomer (also disclosed in the '635 patent) which showed that the reverse isomer had "almost no" or "very poor" activity, and submitted this data to overcome any obviousness rejection over the '635 patent. (*Id.* at 56-57.)

This attack is grounded on an allegation that Rohm and Haas engaged [*142] in iniquitable conduct during its prosecution of the '416 patent. Iniquitable conduct resides in the failure to disclose material information, or the submission of false information, with an intent to deceive. *Kingsdown Medical Consultants, Ltd. v. Hollister, Inc.*, 863 F.2d 867, 872, 9 U.S.P.Q.2D (BNA) 1384 (Fed. Cir. 1988), cert. denied, 490 U.S. 1067, 109 S. Ct. 2068, 104 L. Ed. 2d 633 (1989); see also *Merck*, 873 F.2d at 1420.⁹³ Both materiality and intent to deceive must be shown by clear and convincing evidence. *Kingsdown*, 863 F.2d at 872; see also *J.P. Stevens & Co. v. Lex Tex Ltd.*, 747 F.2d 1553, 1559-60, 223 U.S.P.Q. (BNA) 1089 (Fed. Cir. 1984), cert. denied, 474 U.S. 822, 88 L. Ed. 2d 60, 106 S. Ct. 73 (1985).

93 [HN12] 37 C.F.R. § 1.56 provides in part:

(a) A duty of candor and good faith toward the Patent and Trademark Office rests on the inventor, on each attorney or agent who prepares or prosecutes the application and on every other individual who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application. All such individuals have a duty to disclose to the Office information they are aware of which is material to the examination of the application. Such information is material where there is a substantial likelihood that a reasonable examiner would consider it important in deciding whether to allow the application to issue as a patent. The duty is commensurate with the degree of

involvement in the preparation or prosecution of the application.

[HN13]

[*143] Materiality and intent to deceive must be determined separately. *N.V. Akzo v. E.I. duPont de Nemours & Co.*, 810 F.2d 1148, 1153, 1 U.S.P.Q.2D (BNA) 1704 (Fed. Cir. 1987). If the Court finds that there is clear and convincing evidence of at least a threshold degree of each, then their relative degrees must be balanced to determine whether as a matter of law there has been iniquitable conduct. *J.P. Stevens*, 747 F.2d at 1560; see also *N.V. Akzo*, 810 F.2d at 1153; *In re Jerabek*, 789 F.2d 886, 890, 229 U.S.P.Q. (BNA) 530 (Fed. Cir. 1986); *American Hoist & Derrick*, 725 F.2d at 1364. A final determination by the Court that there has been iniquitable conduct in relation to one or more claims during the prosecution of a patent application renders the entire patent unenforceable. *Kingsdown*, 863 F.2d at 877 (*en banc*); see also *J.P. Stevens & Co.*, 747 F.2d at 1561. Moreover, iniquitable conduct in obtaining one patent may bar enforceability of related patents. See *Keystone Driller Co. v. General Excavator Co.*, 290 U.S. 240, 245-47, 78 L. Ed. 293, 54 S. Ct. 146 (1933). Cf. *SSIH Equipment S.A. v. ITC*, 718 F.2d 365, 378-79 (Fed. Cir. 1983).

The gravamen of Mobil's allegation of iniquitable conduct is that the comparative showing of acifluorfen [*144] and its methyl ester in the Yih affidavit was a misrepresentation, because the results of other tests showing that other prior art compounds had some herbicidal activity were withheld. See *Norton v. Curtiss*, 57 C.C.P.A. 1384, 433 F.2d 779, 794 n. 13, 167 U.S.P.Q. (BNA) 532 (1970). Mobil does not challenge the results of the comparative showing between acifluorfen methyl ester and the reverse isomer *per se*. (See D.I. 316 at 47-75.)⁹⁴ Rather, it challenges the picture presented by Rohm and Haas to the Patent Office by submitting the results of this test and withholding the others.

94 Mobil makes a separate argument addressed, *infra*, that a statement made by Dr. Yih in his affidavit was "false." See Section IV.B.4. *infra*.

Though the facts represented in the Yih affidavit and accompanying remarks may not have been false *per se*, there may nonetheless have been an implied misrepresentation.

Where . . . an applicant attempts to overcome a rejection by submitting a comparative showing of properties, the very act of submitting that showing, apart from what is represented therein, must

also be regarded as a representation. The most meaningful comparison, in such instances, would be that between [**145] the claimed

[*322] invention and the best embodiment of the prior art available. Therefore, in submitting evidence of comparative tests, unless the circumstances indicate to the contrary, an applicant must be held to be representing that his showing includes a fair and accurate demonstration of the closest prior art of which he is aware.

Norton, 433 F.2d at 794 (footnote omitted). Therefore, the Court must determine whether the withheld information was "material" to a "fair and accurate demonstration of the closest prior art," and if so, whether it was withheld with an "intent to deceive."

a. Materiality

Materiality may be established by a showing that a reasonable examiner would consider the withheld information important to a fair and accurate demonstration of the closest prior art. See *In re Jerabek*, 789 F.2d at 890; see also *Merck*, 873 F.2d at 1421; *Western Electric Co. v. Piezo Technology, Inc.*, 860 F.2d 428, 433, 8 U.S.P.Q.2D (BNA) 1853 (Fed. Cir. 1988); *J.P. Stevens*, 747 F.2d at 1562. Mobil argues that it is clear that the undisclosed test results were material because during the reissue proceedings leading to the patents in suit the examiners rejected the claims as structurally obvious [*146] over a number of compounds in the '635 patent, including the 2,4-dichloro MODOWN compound. (D.I. 316 at 61.)

The application for the '416 patent was filed February 12, 1973. (RX 2509, Tab 2; see also MX 1576 at 7.) As of that date Mobil's '635 patent had not issued, but Mobil's '645 patent had on March 28, 1972. (RX 2508, Tab 1.) The '645 patent was directed to 4'-NO[2] 3'-COR diphenyl ether compounds having halogen-only substituted right hand rings, and disclosed the 2,4 dichloro MODOWN compound. (*Id.* at col. 2, line 41 [example 5].)

Rohm and Haas was aware of the MODOWN compound before filing the application at issue. In a memorandum to his supervisor, Dr. Watanabe, dated January 18, 1973, Dr. Yih reported the structure of Mobil's "new broadleaf herbicide" MODOWN, and that it

was "both a pre-emergence and a directed post emergence" herbicide which was being synthesized for comparison with several herbicides including acifluorfen. (MX 1346; Tr. at 1430-31.) By January 29, 1973, the MODOWN compound had been synthesized and was being tested against a variety of weeds and crops along with other compounds including its acid and several of its salts and acifluorfen. (JX 1011 at [*147] 500029; Tr. at 3437.)

The MODOWN compound was employed by Rohm and Haas as a "commercial standard" (MX 1201 at 519679; Tr. at 3438), and test results indicated that the MODOWN compound showed "high activity" applied at 8 lbs./acre pre-emergence and 4 lbs./acre post-emergence. (See MX 1201 at 519676; Tr. at 3439.) In November of 1973, Dr. Wayne Johnson, who reported to Dr. Yih, acknowledged the "herbicidal nature" of the MODOWN compound (MX 1284 at 501955), and proposed the synthesis of 4'-NO[2], 2'-CO[2]R diphenyl ethers with a 2-NO[2], 4-CF[3], and a 2-CN, 4-CF[3] substituted right hand ring (*id.* at 501956).

The '635 patent issued January 8, 1974. (RX 2508, Tab 2.) By April 16, 1974, Rohm and Haas used it as a reference to synthesize 4'-NO[2], 3'-CO[2]H, 2-NO[2], 4-CF[3] diphenyl ether. (MX 1195 at 502749.) As of May 22, 1974, Rohm and Haas had tested the 2-CN, 4-CF[3] and 2-NO[2], 4-CF[3] compounds side-by-side at 2 lbs./acre for pre-emergence activity. (MX 1288 at 500388-89; Tr. at 3563-68.) The MODOWN compound had also been tested side-by-side with acifluorfen methyl ester at 2 lbs./acre. (MX 1288 at 500390-92; Tr. at 3563-68.) But in a Rohm and Haas in-house research report [*148] dated April 5, 1974, Dr. Gerald Kollman wrote that a series of four "2,4-dichloro-3'-substituted carbonyl-4'-nitro diphenyl ether" compounds were synthesized in response to Mobil's "introduction of MODOWN as a selective herbicide," and that they were "considerably less active" than "our leading diphenyl ethers." (MX 1317 at 612593.) The "leading diphenyl ethers" included acifluorfen and its methyl ester. (See Tr. at 3506-07.)

On May 31, 1974, a number of Rohm and Haas scientists and patent department personnel

[*323] met including Drs. Yih and Watanabe. (Tr. at 3451-52; *see also* MX 1194.) In a memorandum reporting the meeting, also dated May 31, 1974, Dr. Yih stated that acifluorfen methyl ester was "generically disclosed" but not claimed in Mobil's '635 patent, although an isomer of it (the reverse isomer) was. (MX 1194 at 521492.) "In order to secure our pending patent," Dr. Yih wrote, "we will prepare this isomer, evaluate in comparison with . . . [acifluorfen methyl ester], and demonstrate the differences between the two compounds." (*Id.*) The reverse isomer had not yet been synthesized or tested before at Rohm and Haas. (Tr. at 3460.) There was also a section of the memorandum [*149] styled "Patent Situation." There Dr. Yih reiterated that the reverse isomer had been disclosed in Mobil's '635 patent issued January 8, 1974, and noted that the '635 patent was a continuation-in-part of "Mobil's MODOWN patent." (*Id.* at 521493-494.) Dr. Yih stated the strategy of synthesizing and testing the reverse isomer against acifluorfen methyl ester to overcome the '635 patent was "strongly supported" by Dr. Watanabe and Mr. Unger, both of whom were at the meeting; and that he would be "willing to bet anyone" that acifluorfen methyl ester "will be 4-10 times more active" than the reverse isomer. (*Id.*)

On June 13, 1974, the claims in the application for the '416 patent were rejected as fully met under § 102 by the '635 patent. (MX 1576 at 63; Tr. at 2479.) On October 11, 1974, Rohm and Haas filed an amendment to the claims to overcome the § 102 rejection, together with the Yih affidavit. (MX 1576 at 68-77.) With respect to the § 102 rejection, Rohm and Haas stated that it believed that the amendment would overcome the rejection by eliminating compounds named in the '635 patent. (MX 1576 at 70. *See also* D.I. 318 at 9.) Rohm and Haas further stated that:

To facilitate [*150] further prosecution in this application, attached hereto is an Affidavit Under Rule 132 presenting facts which are believed to overcome any rejection which may be made by the Examiner under 35 U.S.C. 103. This Affidavit shows data which clearly demonstrates that compounds within applicants claimed genus possess

properties which are unexpected from the properties of the most closely-related prior art compounds. In the Affidavit, two compounds are directly compared for herbicidal activity -- 2-chloro-4-trifluoromethylphenyl 3-carboxymethyl-4-nitrophenyl ether, applicants' elected species, and 4-chloro-2-trifluoromethyl phenyl 3-carboxymethyl-4-nitrophenyl ether, the most closely related compound disclosed by the Theissen patent. As can be seen from the data, applicants' compound possesses not only significantly greater herbicidal activity than the prior art compared, but also has a much greater spectrum of activity than the prior art compound. Thus, it is believed that the . . . [amended] claims define an invention which is neither anticipated nor obvious from the cited reference.

(MX 1576 at 70-71.)

The Yih affidavit, discussed *supra*, compared acifluorfen methyl ester with its reverse [*151] isomer. In it Dr. Yih opined, *inter alia*, that the results showed "highly significant and unexpected" differences between the compounds, with acifluorfen methyl ester being far superior. (*Id.* at 77.) "Furthermore," Dr. Yih opined, the reverse isomer had "almost no pre-emergence herbicidal activity and very poor post-emergence herbicidal activity, especially at low rates of application, and fail[ed] to control these troublesome weeds." (*Id.*)

The '416 claims were thereafter allowed. (MX 1576 at 85-89.) The results of the tests involving MODOWN and the 2-NO[2], 4-CF[3] and 2-CN, 4-CF[3] compounds had not been submitted to the Patent Office. (Tr. at 3565, 3568.)

On September 29, 1975, Rohm and Haas filed an application for the '929 patent, as a continuation-in-part of its application for the '416 patent. (JX 1119.) The '635 was not listed as a reference, but was considered by the examiner as cited and overcome during prosecution of the parent ('416) case. (JX 1058A at 221-22.)

[*324] The '929 claims issued on December 20, 1977. (RX 2509, Tab 3.)

On September 1, 1978, Rohm and Haas filed applications to reissue both the '416 and '929 patents. (JX 1060A-4; JX 1058A-C.) Two claims, [**152] later amended to the form in suit, were added to the '416 case, but none were added to the '929 case. With these applications Rohm and Haas submitted to the Patent Office all of the herbicidal data it could locate with a reasonable search of its files, including that from the tests at issue. (See JX 1058A 78-79; JX 1060A at 84-100; Tr. at 3612-13.)

On January 18, 1979, Mobil requested the Patent Office to postpone the reissue proceedings. (JX 1058A at 72-73; JX 1060A at 79-80.) Mobil argued that in view of the large quantity of technical data and documents filed by Rohm and Haas with the reissues which had not yet been explained by Rohm and Haas, the reissue proceedings should be postponed for three months. (See *id.*)

Rohm and Haas opposed a delay (JX 1058A at 75-77; JX 1060A at 81-83), and on February 5, 1979, filed its explanation of the data submitted. (JX 1058A at 78-121; JX 1060A at 84-130.) Rohm and Haas stated that it had tested a number of compounds from several references, including the '635 and '645 patents, and that the data were contained in the prior submissions at given pages. (JX 1058A and 84; JX 1060A at 93.)

On May 7, 1979, Mobil filed "preliminary comments" [**153] protesting the reissues. (JX 1058A at 122-23; JX 1060A at 132-42.) The comments included the contention that prior to submitting the Yih affidavit Rohm and Haas had tested the 2-NO[2], 4-CF[3] and 2-CN, 4-CF[3] compounds, but had not included the results in the Yih affidavit. (See JX 1058A at 130, 133; JX 1060A at 137-139.)

The first office action in each reissue was issued in November 1979. (JX 1058A at 219-24; JX 1060A at 317-22.) In both cases the claims were rejected as obvious over the '635 patent. (JX 1058A at 222-23; JX

1060A at 319-20.) Both examiners listed six compounds they considered the "closest" prior art. In each case the compounds were the reverse isomer and five all halogen substituted compounds including the MODOWN compound. (See JX 1058A at 222-23; JX 1060A at 319-20.) None of the compounds cited as the "closest" were 4-CF[3] compounds. In rejecting the '416 reissue claims the examiner stated that it was apparent from the Yih affidavit that acifluorfen methyl ester possessed "unobvious properties" over the reverse isomer. (JX 1060A at 319-20.) But a broader showing would be necessary, namely a showing of superior properties over the closest prior art compounds [**154] cited. (*Id.*)

Mobil has not shown by clear and convincing evidence that the results of the Rohm and Haas tests involving the 2-NO[2], 4-CF[3] and 2-CN, 4-CF[3] compounds were material to a fair and accurate demonstration of the closest prior art. The only evidence proffered by Mobil on this point was that Rohm and Haas had tested the two compounds prior to submitting the Yih affidavit, and that the compounds differ from those claimed by Rohm and Haas by one substituent. On the other hand, there is persuasive evidence that the test results were not material. Rohm and Haas submitted the results in question to the Patent Office with the reissue applications. But despite Mobil's specific and vigorous contention that the 4-CF[3] compounds were relevant, no rejection was ever made in either reissue based on these compounds. In fact, in response to Mobil's contention the examiner in the '416 reissue concluded that "compounds with 2-CN, 4-CF[3] substituents are considered to be distinct and not equivalent to those having 2-halo, 4-CF[3] substituents" and that the latter were "unobvious" over the former. (JX 1060C at 979.)

However, Mobil has made a threshold showing that tests comparing [**155] the MODOWN compound to acifluorfen methyl ester were material to a fair and accurate demonstration of the closest prior art. Rohm and Haas submitted the Yih affidavit along with the amendment before any obviousness rejection was made. It represented that it believed the facts contained in

[*325] the affidavit would overcome any obviousness rejection, because the affidavit "clearly" demonstrated that the claimed compounds possessed properties unexpected from "the properties of the most closely-related prior art *compounds*." (Emphasis added.) In the affidavit Dr. Yih stated that the reverse isomer had "almost no pre-emergence . . . and very poor post emergence herbicidal activity, especially at low rates of application."

The MODOWN compound was disclosed in both the '645 and '635 patents. Rohm and Haas was aware of it and had compared it with acifluorfen methyl ester long before the Yih affidavit was filed. Rohm and Haas also was aware that the MODOWN compound showed some herbicidal activity compared with acifluorfen methyl ester, and used it as a "commercial standard." Moreover, in making the obviousness rejections over the '635 patent in both the '416 and '929 reissue proceedings, both [*156] examiners included the MODOWN compound in the "closest" prior art. In view of the foregoing facts the Court concludes that a reasonable examiner would have considered tests comparing MODOWN with acifluorfen methyl ester important to a fair and accurate demonstration of the closest prior art.

Rohm and Haas argues, however, that the MODOWN tests were not material because the law required it to compare the claimed compounds only with the "closest" prior art compound which it believed, and continues to believe, was the reverse isomer. (D.I. 318 at 49-51.) While this may be probative of Rohm and Haas' good faith, *see infra*, it misses the mark on materiality. Information may be important to a reasonable examiner's view of a fair and accurate demonstration of the closest prior art, notwithstanding an applicant's good faith but contrary view. *See J.P. Stevens & Co.*, 747 F.2d at 1567. This was borne out by the rejections and showings required during the reissues.

Rohm and Haas also argues that the tests were not material because the examiner "was well aware" of the '635 patent, he rejected the claims as fully met by it, and if he wanted further tests with other compounds disclosed

[**157] by it he would have requested them. (D.I. 318 at 52.) This argument is somewhat more to the point. Indeed the examiner rejected the claims as fully met by the '635 patent before the Yih affidavit was filed, and the MODOWN compound was disclosed as a working example for which herbicidal data were provided. However, the '635 patent did not disclose the results of Rohm and Haas' MODOWN tests with acifluorfen methyl ester, nor could a workable comparison of MODOWN with acifluorfen methyl ester be constructed from the data provided in the '635 patent and the Yih affidavit. The MODOWN compound was tested at 4 pounds per acre in the '635 patent. (*See* RX 2508, Tab 2, cols. 5-6.) Therefore, the Court cannot conclude that the withheld information was merely cumulative with respect to what was submitted and what the examiner had. *See Merck*, 873 F.2d at 1420-21; *Rolls-Royce, Ltd. v. GTE Valeron Corp.*, 800 F.2d 1101, 1107, 231 U.S.P.Q. (BNA) 185 (Fed. Cir. 1986); *J.P. Stevens & Co.*, 747 F.2d at 1559-60; *Kimberly-Clark Corp. v. Johnson & Johnson*, 745 F.2d 1437, 1455-56, 223 U.S.P.Q. (BNA) 603 (Fed. Cir. 1984).

However, the examiner's possession of the '635 patent does attenuate, somewhat, the degree of materiality of the MODOWN test [*158] results. Likewise, the Yih affidavit made clear that the test results and conclusions therein were based on a comparison of acifluorfen methyl ester and its reverse isomer, and the accompanying remarks made clear that Rohm and Haas considered the reverse isomer to be the closest compound in the '635 patent.

Accordingly, the Court concludes that the results of the Rohm and Haas MODOWN tests were material but that the degree of materiality was attenuated, somewhat, by the facts that the examiner had the '635 patent which disclosed the MODOWN compound and Rohm and Haas made clear that the comparative showing was only with the reverse isomer which it considered the closest prior art.

[*326] b. *Intent to Deceive*

[HN14] Inequitable conduct is not established by a mere showing that information having some degree of materiality was not disclosed. *FMC Corp. v. Manitowoc Co., Inc.*, 835 F.2d 1411, 1415, 5 U.S.P.Q.2D (BNA) 1112 (Fed. Cir. 1987). There must have been an intent to act inequitably. *Kingsdown*, 863 F.2d at 872; see also *FMC Corp.*, 835 F.2d at 1415. The conduct in question, viewed in light of all the evidence, including evidence indicative of good faith, must indicate sufficient culpability to require a finding [*159] of intent to deceive. *Kingsdown*, 863 F.2d at 876 (*en banc*).

The only evidence proffered by Mobil to show an intent to deceive is the following: that the MODOWN compound was disclosed in the '635 patent (RX 2508, Tab 2, Col. 3, 11. 60-61); that Rohm and Haas knew of the '635 patent and that it "could be cited" against their application (MX 1196 at 521278; MX 1194 at 521492, 521494); that Rohm and Haas had used MODOWN as a "commercial standard" and knew it showed some herbicidal activity (MX 1288; Tr. at 3478); and that Rohm and Haas nonetheless decided to run a new test to overcome the '635 reference comparing acifluorfen methyl ester with the reverse isomer "betting" that the acifluorfen compound would be 4 to 10 times more active than the reverse isomer (MX 1194 at 521492, 521494). (D.I. 316 at 73-75.) Mobil argues that this "establishes, at a minimum, gross negligence," but submits that it actually establishes "deliberate scheming" by Rohm and Haas to obtain the '416 patent. (*Id.* at 75.)

The Court cannot agree. The evidence proffered by Mobil establishes "at most" that Rohm and Haas should have also included MODOWN in the comparative showing or disclosed the results [*160] of tests already run.

Rohm and Haas contends that it was following the law when it selected the reverse isomer for testing, because it believed and still does that the reverse isomer was the closest prior art compound in the '635 patent. (D.I. 318 at 26-27.) When Rohm and Haas settled on this

strategy it had not yet tested the reverse isomer. (Tr. at 3460.) Mr. William Lambert, the Rohm and Haas attorney who prosecuted the application, testified that he chose the reverse isomer for the Yih affidavit because he believed it to be the closest in structure to the Rohm and Haas compounds claimed. (Tr. at 3609.) He testified that at that time he believed the standard was "closeness in chemical structure" and that an applicant "had a duty to compare the closest compound of the prior art with the compound of his invention in order to establish patentability, [and] overcome a presumption of prima facie obviousness based on chemical structure." (*Id.* at 3609-10.)

In addition, while the MODOWN compound was also disclosed in the '635 patent, Rohm and Haas regarded the '645 patent as the "MODOWN patent." Dr. Yih referred to the '645 patent as the "MODOWN patent," and to the plan to synthesize [*161] and test the reverse isomer to overcome the '635 patent. (See MX 1194 at 521494.) The '645 patent had, at that time, been issued for over two years.

The Court is persuaded that there was new concern at Rohm and Haas regarding the prosecution of its invention, and that this concern was sparked by the '635 patent and more particularly the disclosure of the reverse isomer. The Court is also persuaded that Rohm and Haas believed in good faith that the reverse isomer was the closest prior art compound in the '635 patent. The remarks accompanying the Yih affidavit clearly stated that Rohm and Haas regarded the reverse isomer as the closest compound. The expert testimony at trial made clear to the Court that reasonable, in fact expert, men could differ as to what was the closest. (See Tr. at 1695-97; Tr. at 2546-47.) In fact, in rejecting Mobil's protest to the reissues one examiner stated that he considered the "closest related compounds" to be the positional isomers, viz: the reverse isomer and its acid and salts. (JX 1060C at 979.) Both examiners in the reissues considered the reverse isomer among the closest prior art. (JX 1058A at 222-23; JX 1060A at 319-20.)

[*327] On this record, [*162] the Court does not find that Rohm and Haas withheld the MODOWN tests (or did not include MODOWN in the comparative test run for the Yih affidavit) with an intent to deceive the Patent Office. Mobil has shown no conduct on the part of Rohm and Haas "the natural consequences of which" would deceive the Patent Office. See *Kansas Jack, Inc. v. Kuhn*, 719 F.2d 1144, 1151 (Fed.Cir. 1983); see also *Merck*, 873 F.2d at 1422. The record does not establish that the choice of only the reverse isomer was so unreasonable or that the activity of MODOWN so high that there is clear and convincing evidence of an intent to deceive. Mobil's own tests showed acifluorfen methyl ester to be 6 to 8 times more active than the MODOWN compound. (Tr. at 1176-78; RX 2122 at 75759-60.) This is within the "4 to 10 times" range projected by Rohm and Haas for the reverse isomer prior to its actual testing. Moreover, there is nothing in the record establishing that the MODOWN compound had been tested against acifluorfen methyl ester at rates as low as those used in the Yih affidavit. (See Tr. at 3512.) Again, Mobil's own conclusion was that acifluorfen methyl ester out-performed the MODOWN compound at [*163] low rates, exhibiting anywhere from 2 1/2 to 8 times the activity of MODOWN. (Tr. at 1200-01, 1204-05; RX 2336.) In fact, when finally compared with the acifluorfen compounds during the reissues the MODOWN compound was overcome.

If the picture presented by the Yih affidavit was incomplete, there is insufficient evidence that Rohm and Haas intended to act inequitably in presenting it. Even if the Court found, as invited to by Mobil, that the record established that the presentation was incomplete as a result of "gross negligence" on the part of Rohm and Haas (i.e. that a reasonable party in its position should have known that the withheld information was material, see *J.P. Stevens & Co.*, 747 F.2d at 1560; see also *Driscoll v. Cebalo*, 731 F.2d 878, 885, 221 U.S.P.Q. (BNA) 745 (Fed. Cir. 1984); *Kansas Jack*, 719 F.2d at 1152), the Federal Circuit has recently pronounced, *en banc*, that a finding that conduct amounts to "gross negligence" does not itself justify an inference of intent to deceive. *Kingsdown*, 863 F.2d at 876 (*en banc*).

Having not found clear and convincing evidence of

even a threshold degree of intent to deceive supported by the record, the Court need not further consider [*164] the materiality of the withheld results. Mobil has failed to establish that the Re '455 and Re '731 claims are unenforceable.

3. Rohm and Haas Misled The Patent Office During Reissue

Mobil next contends that Rohm and Haas misled the Patent Office during the reissue proceedings in several ways. (D.I. 316 at 66-68.) First, Mobil points out that in response to Mobil's memorandum to the Patent Office regarding its claim of inequitable conduct on the part of Rohm and Haas, Rohm and Haas argued:

After Rohm and Haas filed to reissue the '416 patent, Mobil filed a vigorous protest. The Examiner then requested an exhaustive testing of a number of prior art compounds disclosed by Mobil including certain 2,4-dichloro analogues such as MODOWN. These tests were carried out and clearly demonstrated that the Rohm and Haas compounds possess substantially greater effectiveness than those disclosed by Mobil.

(*Id.* citing JX 1060D at 1122.) Mobil concedes that this was an "argument," but contends that it was "totally misleading because it creates the false impression that the comparative tests, which . . . [Rohm and Haas] presented in the Musco Declarations, overcame the Examiner's structural obviousness [*165] rejection of the '416 patent claims" when, in fact, the claims were rejected and not allowed until later amended. (D.I. 316 at 66.) In support of this contention, Mobil offers the decision of the Patent Office finding no inequitable conduct which, according to Mobil, "failed to recognize" the rejection following the Musco submissions. (*Id.* at 67.)

The Court cannot conclude that this "argument" by Rohm and Haas amounts to inequitable conduct. There is no mention of the examiner's structural obviousness rejection of the '416 claims. Rohm and

[*328] Haas simply argues that the data demonstrated the superiority of the Rohm and Haas compounds over the Mobil compounds. Moreover, Rohm and Haas' argument was written in March of 1981, in the present tense. By then, the Rohm and Haas claims had been amended. The Court cannot agree that this was "misleading," much less that it is clear and convincing evidence of inequitable conduct.

Next Mobil contends that in the same document Rohm and Haas falsely stated that the examiner in the '416 case found the reverse isomer to be "the closest specifically-named compound disclosed" in the '635 patent. (D.I. 316 at 67, citing JX 1060D at 1121.) Mobil argues [*166] that this was false because the examiners repeatedly found a number of compounds to be the closest prior art.

The short disposition of this contention is that the examiner did make such a finding in his decision rejecting Mobil's protest and closing prosecution of the '416 case on the merits. The examiner stated:

The amended claims are considered to be patentable over Theissen's U.S. Patent No. 3,784,635 since the Declaration under 37 C.F.R. 1.132 of Antonio L. Ona and of Vincent A. Musco convincingly overcome the Theissen '635 patent by comparing what the examiner considers to be the closest related compounds (positional isomers) and showing of unexpected properties.

(JX 1060C at 979.) The only positional isomers tested were the acid, salt, and ester of the reverse isomer. (JX 1060C at 738-40, 898-900.) In fact the examiner went on to state:

Protestor's attack of the affidavits have been noted and considered. Group Director, Charles E. Van Horn, in response to a petition, noted that there was no clear error in the examiner's position that the "2-CN, 4-CF[3] compounds are distinct and not equivalent to the claimed 2-halo, 4-CF[3] compounds" or "that the positional isomers are [*167] the closest related compounds and provide a proper basis for a comparative showing under 35

CFR 1.132."

(JX 1060E at 1579 [emphasis in original].) Therefore, the Court cannot conclude the statement was false, much less that there is clear and convincing evidence of inequitable conduct.

Finally, Mobil contends that in a preliminary amendment filed in the '416 reissue, Rohm and Haas falsely represented that the reverse isomer was the only named compound in the '635 patent that was an isomer of a Rohm and Haas claimed compounds. (D.I. 316 at 68, citing JX 1060A at 98, 204.) In fact, Mobil contends, there were two compounds in the '635 patent that are isomers of compounds claimed in the '416 patent. (D.I. 316 at 69.) The other compound had only a CF[3] substituent on the right hand ring at the 3-position, and therefore, technically was an isomer because the '416 claims as issued permitted hydrogen at the 2-position.

Rohm and Haas concedes that its statement was technically false. (D.I. 318 at 60.) But Rohm and Haas contends it never intended to mislead the Patent Office and in fact was not aware the statement was false until very recently. Mr. Lambert, Rohm and Haas' patent attorney, [*168] testified that he did not realize the statement was incorrect until his deposition was taken in 1987. (Tr. at 3603.)

The Court is convinced that there was no intent to deceive the Patent Office here either. As aptly put by Mr. Lambert in his testimony at trial:

I note it is very interesting that so many knowledgeable people looked at it so many times and only some nine years after the reissue was originally filed noted that there happened to be this position isomer there. . . . The reissues were actually granted before it was even discovered.

(Tr. at 3604-05.) The Court does not suggest that a party able to conceal its inequitable conduct is in a better position to prevail against a later allegation of it. Rather, in this case the Court is convinced that no one, including Rohm and Haas, was aware that the statement was, in fact, false until years after the statement was made. This not only persuades the Court that

[*329] there was no intent to make a false statement in the first place, but also raises serious question about the materiality of the error. The Court concludes Mobil has failed to convince the court there was inequitable conduct.

4. The Re '455 and Re '731 Claims Are Unenforceable [*169] Because the Yih Affidavit Contained a False Statement

Mobil lastly contends that the Re '455 and Re '731 patents are unenforceable because the Yih affidavit "falsely represented that the results of the comparative test . . . were unexpected to . . . [him]." (D.I. 316 at 75.) Mobil argues that Dr. Yih's statements in his affidavit, that there were "highly significant differences" between the compounds tested and that acifluorfen methyl ester was "significantly and unexpectedly much more active" than the reverse isomer (MX 1576 at 77), were false because he "did not believe that the difference in the test results between . . . [the two compounds] were unexpected." (D.I. 316 at 77.) The only evidence Mobil offers in support of this contention is a prior statement made by Dr. Yih in an in-house memorandum that he "would be willing to bet anyone" that acifluorfen methyl ester would be 4 to 10 times more active than the reverse isomer. (*Id.* at 77, citing MX 1194.)

It is axiomatic that a false statement knowingly made by an affiant to the Patent Office during prosecution of a patent application is inequitable conduct. *See Rohm & Haas Co. v. Crystal Chemical Co.*, 722 F.2d 1556, 1571, 220 U.S.P.Q. 289 [*170] (Fed. Cir. 1983). However, Mobil's basis for contending Dr. Yih's affidavit was false is not convincing.

The Court reaches the same conclusion approaching the matter on either one of two separate tracks. Approaching it one way, Dr. Yih's statement that he "would be willing to bet anyone" that the acifluorfen compound "will be 4 to 10 times more active" than the reverse isomer is simply too vague to convince the Court that Dr. Yih "expected" the relative activities evinced in the affidavit. The statement was made in an in-house memorandum by Dr. Yih to his supervisor where it would

not be uncommon to be enthusiastic if not optimistic about company products. Moreover, while Dr. Yih's precise usage is unclear from the record, at least one definition of "bet" is "to stake on the outcome of an issue." Webster's *New Collegiate Dictionary* at 105 (1976). Thus, while an "expectation" may not necessarily rise to the level of absolute certainty, one reasonable inference from Dr. Yih's statement is that he was uncertain to some extent about the outcome of a comparative test.

Approaching it a somewhat different way, Dr. Yih was already well aware of the absolute herbicidal activity of the acifluorfen [*171] compounds, and more particularly the methyl ester. (Tr. at 3509.) In fact, Dr. Yih's "willing to bet" statement directly referred to the activity of the methyl ester, not the lack of activity of the reverse isomer. According to Mobil's argument, the only result truly unexpected for purposes of overcoming an obviousness rejection would be the first test when the unobvious property was discovered. Thereafter, the activities of other prior art compounds having activities known to be comparable to the first tested against the invention would not be or at least opinions would have to be qualified accordingly. It seems that Mobil would have required Dr. Yih to say instead "before I knew of the activity of acifluorfen methyl ester, I would not have expected the difference in its activity vis-a-vis its reverse isomer." Such semantic rigidity would serve no useful purpose in our Patent System. From this record there is not clear and convincing evidence that the results were expected to Dr. Yih or that he intentionally deceived the Patent Office to the contrary.

Therefore, based on either line of reasoning above, the Court concludes that Mobil has not shown that there was a false statement [*172] or inequitable conduct.

V. INFRINGEMENT OF THE PATENTS IN SUIT

[H1N15] Infringement is the unlicensed making, using, or selling of a claimed invention. 35 U.S.C. § 271(a); see also *SRI Int'l v. Matsushita Electric Corp.*, 775 F.2d 1107, 1123

[*330] 227 U.S.P.Q. (BNA) 577 (Fed. Cir. 1985). A patentee bears the burden of proving infringement by a preponderance of the evidence. *Hughes Aircraft Co.*, 717 F.2d at 1361; see also *Richardson*, 868 F.2d at 1238; *Laitram Corp. v. Cambridge Wire Cloth Co.*, 863 F.2d 855, 867 (Fed. Cir. 1988), cert. denied, 490 U.S. 1068, 109 S. Ct. 2069, 104 L. Ed. 2d 634 (1989).

The allegations of infringement made here by each party are based solely on the other's commercial making, using and/or selling of one or more compounds within the scope of the respective patents in suit. (D.I. 283, Tab 3A, para. 9.2.)⁹⁵ Moreover, as pointed out, *supra*, the parties have stipulated that to the extent patents asserted against them are valid and enforceable certain of their activities were infringing.

95 Neither party alleges infringement based solely on tests, demonstrations, and experiments to gather data for purposes of registration with governmental agencies. (D.I. 283, Tab 3A, para. 9.2.)

[HN16] There can be no infringement [*173] of an invalid patent. *American Infra-Red Radiant Co., Inc. v. Lambert Indus., Inc.*, 360 F.2d 977, 994 (8th Cir.), cert. denied, 385 U.S. 920, 17 L. Ed. 2d 144, 87 S. Ct. 233, 151 U.S.P.Q. (BNA) 757 (1966). Therefore, in view of the Court's conclusion in Section IV.B. *supra*, that the Mobil claims are invalid, the Court need not address otherwise infringing activities of Rohm and Haas.

Rohm and Haas alleges that Mobil Oil Company, RPI, and RPAG are guilty of infringement of the Rohm and Haas patents in suit, either by direct infringement, contributory infringement or actively inducing infringement. (D.I. 318 at 63.) Since the issuance of Re '731 and Re '455, RPI has commercially made and sold acifluorfen sodium in the United States, and has commercially made and sold a herbicidal composition containing acifluorfen sodium and an agronomically acceptable carrier in the United States. (D.I. 283, Tab 3A, para. 9.2.) Since both patents were issued RPI has also induced others to practice, in the United States, a method

of controlling weeds which comprises applying acifluorfen sodium to weed seedlings in an amount sufficient to control the growth of the seedlings, and a method of controlling weeds which comprises applying acifluorfen sodium [*174] to weed seedlings at the rate of 0.1 to about 12 pounds per acre sufficient to control the growth of the seedlings. (*Id.* at P 9.21.) Since the Court found Re '731 and Re '455 neither invalid nor unenforceable, RPI has stipulated that the activities outlined above constitute infringement of Claims 8 and 9 of Re '731 and Claims 1 and 2 of Re '455 and "contributory infringement and/or active inducement of infringement" of Claims 6 and 7 of Re '455. (*Id.* at P 9.22, 9.23.) Therefore, the Court will enter judgment accordingly.

RPAG has commercially made and sold a herbicidal composition containing acifluorfen sodium as its active ingredient in the United States. (D.I. 283, Tab 3B, para. 17.1.) Commencing in 1987 and continuing to date RPAG has commercially made and sold TACKLE in the United States. (*Id.* at P 17.2.) Subsequent to the issuance of Re '731 and Re '455, RPAG has commercially made and sold acifluorfen sodium in the United States, has commercially made and used acifluorfen in the United States, and has commercially made and sold a herbicidal composition containing acifluorfen sodium and an agronomically acceptable carrier in the United States. (*Id.* at P [*175] 17.3.) Also, subsequent to the issuance of Re '731 and Re '455 RPAG has induced others to practice, in the United States, a method of controlling weeds which comprises applying acifluorfen sodium to weed seedlings in an amount sufficient to control the growth of the seedlings, and a method of controlling weeds which comprises applying acifluorfen sodium to weed seedlings at a rate of 0.1 to about 12 pounds per acre sufficient to control the growth of the seedlings. (*Id.* at P 17.4.) Since the court found Re '731 and Re '455 neither invalid nor unenforceable, RPAG has stipulated that the activities outlined above constitute infringement of Claims 8 and 9 of Re '731 and Claims 1 and 2 of Re '455, and "contributory infringement and/or active inducement of infringement of Claims 6 and 7 of

[*331] Re '455. (*Id.* at PP 17.5, 17.6.) Therefore, the Court will enter judgment accordingly.

Rohm and Haas also contends that the stipulated facts establish that Mobil Oil actively induced infringement of Re '731 and Re '455. (D.I. 318 at 64.) The activities of Mobil Oil on which Rohm and Haas' contention is predicated are Mobil Oil's "initial actions implementing the registration and sale of TACKLE." [*176] and "the terms and consequences of the subsequent Sales Agreement between Mobil Oil and RPI (JX 2431)." (D.I. 318 at 64-65.)

[HN17] 35 U.S.C. § 271(b) provides that "whoever actively induces infringement of a patent shall be liable as an infringer." Therefore, [HN18] a party infringes "by actively and knowingly aiding and abetting another's direct infringement." *Water Technologies Corp. v. Calco, Ltd.*, 850 F.2d 660, 668, 7 U.S.P.Q.2D (BNA) 1097 (Fed.Cir. 1988) (emphasis in original); *see also Power Lift, Inc. v. Lang Tools, Inc.*, 774 F.2d 478, 480-81, 227 U.S.P.Q. (BNA) 435 (Fed.Cir. 1985).

The facts Rohm and Haas relies on are as follows. By September of 1980, Mobil Oil was commercially manufacturing acifluorfen and converting it to acifluorfen sodium for export in a formulated product. (D.I. 283, Tab 3B, paras. 16.14-16.16.) In late April of 1981, Mobil sought commercial registration of acifluorfen sodium from the EPA. (*Id.* at P 16.17.)

On July 31, 1981, Mobil Oil sold its agricultural chemicals business, including the patents in suit, to RPI. (RX 2601, Tab A, para. 1.A2.) Under the terms of the "Agreement For Purchase and Sale" between Mobil Oil and RPI (JX 2431), RPI "was obligated to "use its best efforts to develop, register, [*177] market, sell and promote TACKLE herbicide in a manner which will achieve the maximum potential for the product." (*Id.* at § 11.06(a)(iii).) Mobil was entitled under the agreement to 5 percent of the net sales of TACKLE in the United States. (*Id.* at § 2.01(b)(v).) The term "best efforts" meant that RPI would pay minimum specified sums of money to Mobil Oil each year commencing in 1985, and increasing in 1986 through 1987 and extending until 1996. (RX 2601, Tab A, para. 1.A3; *see also* JX 2431 at § 11.06(c)

and Attachment 11.06(c).) This clause was included at the insistence of Mobil Oil to encourage sales of TACKLE. (McGregor Dep. at 80-81, 158, 167.) Mobil Oil was anticipating substantially more than the minimum payments under the agreement. (*Id.* at 140-41, 167.)

RPI was also obligated under the agreement to provide Mobil Oil with semiannual reports on the status of the registration, testing and marketing, and annual and five-year forecasts for the sales of TACKLE. (RX 2601, Tab A, para. 1.A3; *see also* JX 2431 at § 11.06(b).) This provision was to enable Mobil Oil to keep track of payments due. (McGregor Dep. at 160.) Mobil Oil has received and continues to receive [*178] payments for RPI's sales of TACKLE under the agreement. (RX 2601, Tab A, para. 1.A3.)

There is no question in this case but that Mobil Oil knew when it entered into the agreement with RPI that if the Rohm and Haas patents were valid and enforceable then TACKLE infringed Rohm and Haas patents. Both civil actions were filed before the agreement was made. Moreover, it is clear from the record that Mobil would have known when the Rohm and Haas patents in suit were issued that, in fact, TACKLE infringed.

The question, then, is whether the evidence establishes that Mobil Oil "actively" induced the infringement by RPI. *See A. Stucki Co. v. Worthington Indus., Inc.*, 849 F.2d 593, 597, 7 U.S.P.Q.2D (BNA) 1066 (Fed. Cir. 1988). The Federal Circuit has interpreted the legislative history of § 271(b) as suggesting a "broad reading" should be given to this section. *Power Lift*, 774 F.2d at 481. The legislative history cited by the Federal Circuit provides that § 271(b) "recites in broad terms that one who aids and abets an infringement is likewise an infringer," and that § 271(b) "is a broad statement and [an] enactment of the principle that one who actively induces infringement of a patent is likewise liable for [*179] infringement." *Id.* (quoting S.Rep. No. 1979, 82nd Cong. 2d Sess., at 9 (1952) and P.J. Federico, *Commentary on the New Patent Act*, 35 U.S.L.A. 1, 53 (1954) respectively).

[*332] [HN19] Infringement is a tort. *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1579, 1 U.S.P.Q.2D (BNA) 1081 (Fed. Cir. 1986). Therefore, the Court finds some initial guidance for assessing the conduct of Mobil Oil by looking to tort principles regarding the liability of persons acting in concert. To this end § 876 of the *Restatement (Second) of Torts* provides that:

For harm resulting to a third person from the tortious conduct of another, a person is liable if he knows . . . that the other's conduct constitutes a breach of duty and gives substantial assistance or encouragement to the other so to conduct himself.

4 *Restatement (Second) Torts* § 876(b) (1977).

Here the Court is persuaded that the ongoing relationship between Mobil Oil and RPI encourages and induces the infringing activities of RPI. The agreement provides for minimum payments to Mobil Oil which escalate from year to year. Moreover, Mobil Oil receives additional payments based directly on the net sales of TACKLE. Accounting has to be made to Mobil Oil specifically [*180] with respect to TACKLE. Therefore, with guidance from the noted principles of tort law and the legislative history suggesting a broad reading of § 271(b), the Court concludes that Mobil Oil also is an infringer under § 271(b). Judgment will be entered accordingly.

VI. INJUNCTION

Rohm and Haas also seeks an order enjoining Mobil from future infringement of its patents. (See D.I. 318 at 68.)⁹⁶

96 Though not now pertinent, Mobil also requested an order enjoining future infringement by Rohm and Haas and BASF were the Mobil patents upheld. (D.I. 319 at 219.)

[HN20] The principal value of a patent is its statutory right to exclude others from the unlicensed practice of the invention. *Hybritech, Inc. v. Abbott Laboratories*, 849 F.2d 1446, 1456-57, 7 U.S.P.Q.2D (BNA) 1191 (Fed. Cir. 1988); *H.H. Robertson, Co. v. United Steel Deck, Inc.*, 820 F.2d 384, 390 (Fed. Cir. 1987); see *Connell v. Sears, Roebuck & Co.*, 722 F.2d

1542, 1548, 220 U.S.P.Q. (BNA) 193 (Fed. Cir. 1983); *Smith Int'l, Inc. v. Hughes Tool Co.*, 718 F.2d 1573, 1581, 219 U.S.P.Q. (BNA) 686 (Fed. Cir.), cert. denied, 464 U.S. 996, 78 L. Ed. 2d 687, 104 S. Ct. 493, 220 U.S.P.Q. (BNA) 385 (1983). Ordinarily a court should not be reluctant to use its equitable powers to ensure a patentee can protect this right with respect to future infringers. *Id.* [HN21] [*181] Once the patent has survived the allegations of invalidity and has been proved infringed, the patentee should be entitled to the full protection of its right. See *id.* Thus, irreparable harm from future unlicensed practice may be presumed. *H.H. Robertson*, 820 F.2d at 390; *Roper Corp. v. Liton Systems, Inc.*, 757 F.2d 1266, 1271, 225 U.S.P.Q. (BNA) 345 (Fed. Cir. 1985); *Smith Int'l*, 718 F.2d at 1581.

In this case the Rohm and Haas patents have withstood Mobil's allegations of invalidity and unenforceability, and have been proved infringed. Therefore, the Court will enter an order enjoining Mobil from future infringement of the Re '455 and Re '731 claims.

VII. CONCLUSION

Rohm and Haas has proved by clear and convincing evidence that the claims in suit of the Mobil patents, '437, Re '215, Re '216, and '622, are not entitled to the February 11, 1971 filing date of the 1971 application. As such the Rohm and Haas Netherlands application is § 102(b) prior art. Rohm and Haas has also shown by clear and convincing evidence that the claims in suit are invalid over this reference as either anticipated under § 102 or obvious under § 103.

Mobil has not proved by clear and convincing evidence that the Rohm and [*182] Haas claims in suit of patents Re '731 and Re '455 are invalid as obvious over Mobil's '635 patent, or unenforceable for inequitable conduct in the Patent Office.

Rohm and Haas has proved by a preponderance of the evidence that (1) RPI infringed Claims 8 and 9 of Re '731 and Claims 1 and 2 of Re '455, and has contributorily infringed "and/or" actively induced infringement of Claims 6 and 7 of Re '455; (2) RPAG has infringed Claims 8 and 9 of Re '7321 and Claims 1 and 2 of Re '455, and has contributorily infringed "and/or" actively induced infringement of Claims 6 and 7 of Re '455; (3) and that Mobil Oil has

[*333] actively induced the infringing activities of RPI.

Therefore, based on the findings of fact and conclusions of law encompassed in this Opinion, the Court will enter a judgment in this case which shall (1) adjudge that Mobil has not met its burden of proving by clear and convincing evidence that the Rohm and Haas claims in suit are invalid as obvious or are unenforceable for inequitable conduct; (2) adjudge that Rohm and Haas has met its burden of proving by clear and convincing evidence that the Mobil claims in suit are invalid as either anticipated or obvious; (3) adjudge that Rohm and [*183] Haas has proved by a preponderance of the evidence that Mobil Oil, RPI, and RPAG have infringed, or contributorily or actively induced infringement of the Rohm and Haas claims in suit; (4) enter an order permanently enjoining Mobil from continued infringement of the Rohm and Haas claims; and (5) order an accounting to determine the damages caused by Mobil's infringement.

JUDGMENT

For the reasons set forth in the court's Findings of Fact and Conclusions of law embodied in the Opinion entered in this case on this date, it is

ORDERED, ADJUDGED AND DECREED that:

1. Mobil Oil Corporation ("Mobil Oil"), Rhone-Poulenc Inc. ("RPI"), Rhone-Poulenc Agrochimie ("RPA"), and Rhone Poulenc AG Company ("RPAG") have not met their burden of proving by clear and convincing evidence that Rohm and Haas Claims 1, 2, 6, and 7 of U.S. Reissue Patent 31,455 or Rohm and Haas Claims 8 and 9 of U.S. Reissue Patent 31,731 are (a) invalid based on obviousness under 35 U.S.C. § 103, or (b) unenforceable for inequitable conduct on the part of Rohm and Haas Company.

2. Rohm and Haas Company has met its burden of proving by clear and convincing evidence that (a) Mobil Claim 1 of U.S. Patent 3,979,437, Mobil Claims [*184] 4, 5, and 6 of U.S. Reissue Patent 32,215, and Mobil Claims 1, 3, 5-9, and 11-15 of U.S. Patent 4,681,622 are

invalid based on anticipation under 35 U.S.C. § 102, and (b) Mobil Claims 4, 5, and 6 of U.S. Reissue Patent 32,216 are invalid based on obviousness under 35 U.S.C. § 103.

3. Rohm and Haas Company has met its burden of proving by a preponderance of the evidence that RPI and RPAG have infringed under 35 U.S.C. § 271 its Claims 8 and 9 of U.S. Reissue Patent 31,731 and its Claims 1 and 2 of U.S. Reissue Patent 31,455 and have contributorily infringed and/or actively induced infringement of its Claims 6 and 7 of U.S. Reissue Patent 31,455, by (a) commercially making and selling acifluorfen sodium in the U.S., (b) commercially making and using acifluorfen in the U.S., commercially making and selling a herbicidal composition containing acifluorfen sodium and an agronomically acceptable carrier in the U.S., and (c) inducing others to practice in the U.S. (i) a method of controlling weeds which comprises applying acifluorfen sodium to weed seedlings in an amount sufficient to control the growth of the seedlings, and (ii) a method of controlling weeds which comprises applying acifluorfen [*185] sodium to weed seedlings at the rate of 0.1 to about 12 pounds per acre sufficient to control the growth of the seedlings.

4. Rohm and Haas Company has met its burden of proving by a preponderance of the evidence that Mobil Oil has actively induced the infringing activities of RPI under 35 U.S.C. § 271(b) and therefore is liable as an infringer of Rohm and Haas patents in suit.

5. Mobil Oil, RPI, RPA, and RPAG, their officers, agents, employees, and licensees, if any, are hereby permanently enjoined from continuing to infringe, manufacture, use, or sell any product which embodies the invention of Rohm and Haas Claims 1, 2, 6, and 7 of U.S. Reissue Patent 31,455 or Rohm and Haas Claims 8 and 9 of U.S. Reissue Patent 31,731.

6. An accounting to determine damages for past infringement is hereby ordered.

Dated: June 30, 1989.